# ADAPTIVE CORRELATES OF SOCIALLY AGGRESSIVE BEHAVIOR IN PEER RELATIONSHIPS

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ABSTRACT
NICOLE HEILBRON: Adaptive Correlates of Socially Aggressive Behavior in Peer Relationships
(Under the direction of Mitch Prinstein, Ph.D.)

This study examined concurrent and longitudinal associations among overt and social forms of aggression, peer status, and friendship quality over an 11-month period. A sample of 559 adolescents (50% girls) in grades 6-8 participated in the study. Participants completed a measure of friendship quality at both time points. Measures of aggression and peer status (preference-based and reputation-based popularity) were collected using a standard sociometric procedure. Results suggested a modest curvilinear effect such that high levels of social aggression were associated with slight increases in both preference- and reputation-based popularity for boys. No effects were revealed for the prediction of either of the peer status constructs from social aggression for girls. With respect to friendship variables, high levels of overt aggression were associated with a lower likelihood of friendship reciprocity, whereas high levels of social aggression were associated with less stable friendships over time. High levels of both overt and social aggression were associated with slight decreases in self-reported positive and negative friendship quality for boys and girls. Implications for understanding the complex patterns of association among different forms of aggression, peer group status, and friendship quality are discussed.

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# CHAPTER I

## INTRODUCTION

Perhaps one of the most pressing concerns examined in clinical child psychology pertains to the predictors and consequences of aggressive behavior. Over the past three decades, a considerable empirical literature has demonstrated associations between physical aggression and various indices of social incompetence, including social-cognitive biases, social skill deficits, and peer rejection (e.g., Dodge, 1983; Lochman & Dodge, 1998). Numerous longitudinal studies have identified childhood physical aggression as a risk factor for future delinquency, criminal activity, school dropout, and substance use during adolescence and adulthood (e.g., Nagin & Tremblay, 1999; Patterson, Capaldi, & Bank, 1991). Given that treatment of antisocial and aggressive behavior represents the leading cause of referral to inpatient and outpatient clinics for adolescents, knowledge of the adverse correlates and consequences of aggression has been critical for informing effective intervention and prevention programs (Kazdin, 1995).

Although physical behaviors have been the focus of the majority of research efforts on aggression, recent interest in the constructs of social, relational, and indirect aggression has prompted a reexamination of the form, function, and operationalization of aggressive behavior (Underwood, 2003). Whereas physical and verbal aggression involve overt behaviors such as inflicting or threatening physical harm, social, relational, or indirect forms of aggression are defined in terms of behaviors aimed at causing social or interpersonal harm through overt or covert means. The earliest studies of this broadened conceptualization

revealed that nonphysical aggression (e.g., snubbing, ignoring) was experienced as hurtful by victims (Feshbach, 1969; Feshbach & Sones, 1971). Research demonstrating similar deleterious consequences of nonphysical forms of aggression has rapidly proliferated in the past decade (e.g., Crick, 1995, 1997; Crick & Grotpeter, 1995; Galen & Underwood, 1997). However, there is a danger that empirical work on these topics has outpaced the development of theory needed to guide this research in the most productive directions. This study offered a preliminary exploration of nonphysical forms of aggression in friendship and group contexts with a careful consideration of theory and conceptualization that should underpin this and future investigations.

*Purposes of the Present Study*

The present study was motivated by the hypothesis that socially aggressive behaviors may be associated with both adaptive and maladaptive social-psychological correlates. To explore specific questions related to this hypothesis, at least two central issues must be addressed. First, there is considerable confusion regarding the nomenclature used to describe social types of aggressive behaviors. Second, work on nonphysical forms of aggression has remained relatively detached from theoretical advances that have been widely adopted regarding the psychological mechanisms of physically aggressive behavior. Accordingly, the purposes of the present study were: (a) to outline basic strategies used to define social forms of aggression; (b) to review several key theories developed predominantly in reference to physical aggression; and (c) to explore the applicability of such theoretical perspectives to socially aggressive behaviors. Based on this review, the present study examined adaptive and maladaptive longitudinal correlates of social aggression in both group and dyadic friendship contexts.

*Review of Definitions and Key Findings*

As research on nonphysical forms of aggressive behavior has expanded over the past decade, theorists have lamented the definitional obfuscation that now characterizes work in this area. Therefore, it is instructive to begin by clarifying underlying differences in constructs referred to as social, relational, and indirect aggression. Social aggression refers to behaviors that intentionally damage interpersonal relationships and/or social status through nonconfrontational and generally concealed methods. Socially aggressive behaviors typically require the involvement of members of the social community (e.g., gossip, social exclusion, ostracism, negative facial expressions; Cairns, Cairns, Neckerman, Ferguson, & Gariepy, 1989; Galen & Underwood, 1997; Paquette & Underwood, 1999). This broad definition is designed to include both direct and indirect behaviors, verbal and nonverbal social exclusion, malicious gossip, and friendship manipulation (Underwood, 2003).

Though similar to the social aggression construct, relational aggression has been defined as subtly, but importantly distinct. Relationally aggressive behaviors also are defined as behaviors that cause social rather than physical harm. However, relationally aggressive behavior primarily involves the direct manipulation of peer relationships and by definition, does not include negative facial expressions or gestures (Crick, 1995, 1997; Crick & Grotpeter, 1995). These behaviors may be confrontational (e.g., publicly excluding a peer from the social group) or nonconfrontational (e.g., character defamation), and may or may not involve members of the social community. Individual differences in relational aggression are typically assessed using a peer nomination instrument (e.g., Crick & Grotpeter 1995). Several factor analytic studies report evidence that the behaviors used to define social and relational aggression cluster together (Bjorkqvist, Lagerspetz, & Kaukiainen, 1992;

Crick & Grotpeter, 1995). That said, this issue has been confounded by measurement and methodological constraints, and therefore continues to be a subject of considerable debate within the literature (Bjorkqvist et al., 1992; Crick & Grotpeter, 1995; Underwood, 2003).

Lastly, indirect aggression broadly refers to behaviors that are covert, such as ignoring, avoiding, or excluding others from social interactions (Bjorkqvist et al., 1992). This terminology was first introduced by Feshbach (1969, 1971) to define the behavior of individuals who snubbed a newcomer during a laboratory observation session. Lagerspetz and colleagues later adopted the term to refer to behavioral strategies that allow the aggressor to cause harm without being identified by the victim (e.g., Bjorkqvist, Osterman, & Kaukiainen, 1992; Lagerspetz & Bjorkqvist, 1994; Lagerspetz, Bjorkqvist, & Peltonen, 1988). Indirect aggression is distinct from social aggression because the perpetrator does not necessarily employ other members of the peer group in the aggressive act and refers specifically to nonconfrontational behaviors (Xie, Cairns, & Cairns, 2004). Perhaps because of this rather limiting definition of behavior, indirect aggression is the least frequently studied of the three forms.

Through the process of clarifying distinctions between social, relational, and indirect aggression, it is apparent that these constructs share an inherent definitional complexity that does not characterize physical aggression. Although there are similarities in the conceptualizations, semantic and definitional issues have plagued prior studies of social aggression. Given that the existing definition of social aggression represents the broadest of the three conceptualizations, this term is used for clarity and ease of presentation.

*Emphases of Recent Research on Socially Aggressive Behaviors*

In spite of the contentious debate among scholars as to what extent social, relational, and indirect aggression represent overlapping constructs, research linking nonphysical forms of aggression to indices of social-psychological maladjustment has made an impressive contribution to the scientific literature. Over the past decade, studies of children, adolescents, and young adults who are the targets of socially aggressive behaviors have demonstrated clear associations between this form of victimization and concurrent social and emotional difficulties (Crick, Casas, & Nelson, 2002; Crick & Grotpeter, 1996; Prinstein, Boergers, & Vernberg, 2001; Werner & Crick, 1999). Experiences of relational aggression in childhood have also been implicated in the prediction of future maladjustment for both sexes (Crick, 1996; Crick & Bigbee, 1998; Crick, Casas, & Ku, 1999; Crick & Grotpeter, 1995).

Research on the social-psychological adjustment of social aggressors is in its early stages; however, the evolution of the literature is notable for its emphasis on gender differences in the frequency and psychological correlates of social aggression (e.g., Crick, 1996; Crick & Grotpeter, 1995). This emphasis has been, quite explicitly, designed to address a perceived bias of past research (Crick, 1995). Specifically, this work has been motivated by a stated desire to demonstrate that socially aggressive behaviors are forms of maladjustment, or even psychopathology, that have gone unnoticed due to a relative neglect of girls' mental health issues (Crick, Wellman, Casas, O'Brien, Nelson, & Grotpeter, 1999). As definitions of nonphysical aggression were expanded from obviously confrontational behaviors (e.g., social exclusion, rejection) to include more subtle behaviors (e.g., eye-rolling, gossip), many studies began to question whether forms of social aggression are more common among girls, and to what extent such behaviors correspond to the developmental trajectories of physically aggressive boys (e.g., Crick, Bigbee, & Howes, 1996; Crick & Grotpeter, 1995). Empirical

findings support the contention that boys are more verbally and physically aggressive than girls (e.g., Coie, Dodge, & Copottelli, 1982; Crick & Grotpeter, 1995), and that girls are more likely to use social rather than physically aggressive strategies to harm a target (see Crick, Wellman, et al., 1999 for a review). However, data are equivocal about whether girls are more socially aggressive than boys, with some studies finding evidence for this proposition (e.g., Crick & Grotpeter, 1995; Lagerspetz et al., 1988; McNeilly-Choque, Hart, Robinson, Nelson, & Olsen, 1996), some finding no such gender differences (Hart, Nelson, Robinson, Olsen, & McNeilly-Choque, 1998; Pakaslahti & Keltikanagas-Jaervinen, 2000; Phillipsen, Deptula, & Cohen, 1999; Rys & Bear, 1997; Willoughby, Kupersmidt, & Bryant, 2001) and still others finding that boys are more socially aggressive than girls (David & Kistner, 2000; Henington, Hughes, Cavell, & Thompson, 1998; Tomada & Schneider, 1997).

In addition to addressing whether socially aggressive behavior is more common among girls than boys, researchers have used conceptual frameworks from studies of physical aggression to explore the psychological correlates of social aggression (Underwood, 2003). For example, associations between physical aggression in boys and social-information processing biases, experiences of peer rejection, and long-term negative psychological outcomes have been well-established in some research literature. Accordingly, it seems reasonable to anticipate similar links between social aggression in girls and maladaptive consequences. In fact, it has been argued that social aggression may serve a similar function in the developmental psychopathology of girls as physical aggression does in boys (Crick, Wellman, et al., 1999). There remains a relative paucity of research to support this hypothesis; however, preliminary evidence indicates that girls who are nominated by peers as socially aggressive demonstrate a social-information processing bias of interpreting

ambiguous interpersonal cues as hostile (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002). With respect to psychological maladjustment, preliminary findings from studies of preschool and school-aged children, adolescents, and young adults suggest that social aggression is concurrently associated with, and sometimes longitudinally predictive of, difficulties in the peer domain (e.g., peer rejection) and internalized distress (e.g., depression, anxiety, loneliness) (Crick, Casas, & Mosher, 2002; Crick & Grotpeter, 1996; Prinstein et al., 2001; Werner & Crick, 1999). Results from several cross-sectional and longitudinal studies of socially aggressive boys and girls suggest that these children are at increased risk for peer rejection and involvement with deviant peers (e.g., Crick, 1996; Werner & Crick, 2004).

In sum, research to date has provided the essential groundwork for advancing conceptualizations of socially aggressive behavior. Despite the lack of consensus about terminology, researchers have generated an important body of literature demonstrating that the construct captured within the definitions of indirect, social, and relational aggression represents a robust psychological phenomenon. Given that the vast majority of studies have been informed by well-developed theoretical models of physical aggression in boys, research on social aggression has generally focused on identifying the maladaptive consequences associated with such behaviors and describing gender differences in how children aggress. Unfortunately, most research in this area has been based on untested assumptions regarding the nature of socially aggressive behaviors. As a consequence, research on social aggression largely has adopted theories and approaches from the physical aggression literature without careful consideration of whether behavior defined as socially aggressive truly meets established definitions of aggression. Although it is acknowledged that some ambiguity exists in considering the causes and consequences of any aggressive behavior, it is argued

below that because of the varied manifestations and dependence on intangible, social (i.e., nonphysical) goals, social aggression is more difficult to characterize as 'aggressive' than has been suggested in past literature.

*Questioning Basic Assumptions: Emerging Issues*

Although the methods and constructs derived from the history of research on physical aggression have proven invaluable in extending our knowledge of socially aggressive behaviors, it has become clear that new models for defining and classifying social aggression are warranted (Underwood, 2003; Underwood, Galen, & Paquette, 2001). Indeed, the focus on establishing parallels between the developmental psychopathology of physical aggression in boys and social aggression in girls may have obscured fundamental differences between the functions and potential clinical significance of these behaviors. As such, recent efforts to further our scientific understanding of the development of socially aggressive behavior have underscored the importance of questioning the emphasis on maladjustment (Hawley, 2003; Underwood, 2003). To this end, there also are calls to explore whether existing definitions are perhaps overly inclusive of behaviors that have been prematurely and inaccurately deemed aggressive. Of particular importance are two key issues; (a) the inherent ambiguity of many behaviors currently defined as social aggression; and (b) the problems that arise from confounding how an individual aggresses (i.e., the form of the behavior) and why an individual aggresses (i.e., the function of the behavior). A discussion of these issues is provided below.

Aggressive behaviors typically are defined as such by meeting two basic definitional criteria. Specifically, behavior qualifies as aggressive if it is intended to harm a target and the target perceives harm as a consequence of the aggressor's act (Coie & Dodge, 1998; Harré &

Lamb, 1983, Parke & Slaby, 1983). It may be argued that instances of physical aggression clearly meet these criteria. In contrast to social aggression, physically aggressive behaviors are generally defined by the behavior or action itself (e.g., hitting, punching). However, problems arise when applying these ideas to socially aggressive behavior. The definition of social aggression requires consideration of the social context and cannot easily be reduced to a set of observable behaviors. Behaviors currently included in contemporary definitions of socially aggressive behavior (e.g., eye-rolling, gossip, social exclusion) may represent emotional expression rather than behaviors directed towards a target. Moreover, these behaviors actually may serve prosocial, normative functions such as establishing greater intimacy between friends and establishing network boundaries. This contention is controversial because it questions a basic assumption of the conceptualization of social aggression as psychopathology. Although it is not suggested that socially aggressive behaviors are exclusively adaptive, it does appear that these behaviors present challenges to current classification systems of aggressive behavior.

In addition to these definitional issues, a remaining key issue pertains to the goals of aggressive behavior. Empirical research on physical aggression generally has supported the distinctiveness and differential predictive characteristics of behaviors that are reactive versus proactive (e.g., Atkins & Stoff, 1993; Crick et al, 1997; Dodge & Coie, 1987; Hartup, 1974; Poulin & Boivin, 1999, 2000; Price & Dodge, 1989; Pulkkinen, 1996). Attempts to apply this dichotomy to socially aggressive behaviors illustrate difficulties in current conceptualizations of the social aggression construct.

Reactive aggression is conceptualized as a response to antecedent conditions of provocation or frustration that tend to be interpersonal and hostile. (Dodge & Coie, 1987).

This notion is predicated on the long-studied frustration-aggression hypothesis (Dollard, Doob, Miler, Mowrer, & Sears, 1939). This hypothesis posits that aggression is the natural behavioral outcome of an individual's experience of goal-blocking and frustration (Dollard et al., 1939). Revisionists (e.g., Berkowitz, 1962, 1989) have modified the theory, restricting tests of the hypothesis to behaviors that are hostile rather than instrumental in nature, and to situations for which the resultant frustration stems from the failure to attain an anticipated gratification, rather than in situations of deprivation. Berkowitz (1989) further stipulates that frustration in response to aversive events only is likely to generate aggressive acts to the extent that the events themselves produce negative affect for the individual. In the initial conceptualization of the frustration-aggression hypothesis, Dollard and colleagues proposed that in some cases, the threat of retaliation or punishment necessarily restricts the direct expression of aggression, but noted that this restriction does not change the motivation to aggress. Accordingly, certain situations may produce a displacement of the aggressive response in which the individual minimizes the threat of punishment by acting aggressively through more indirect channels.

There are several ways that the frustration-aggression hypothesis provides a useful framework for integrating existing conceptualizations of reactive forms of social aggression. From a theoretical perspective, social aggression might function as an outlet for the expression of anger in the context of reduced likelihood of damaging retaliation or punishment. To the extent that this may be true, it follows that there are obvious advantages to using social aggression in the expression of negative affect. For example, physical assaults and threats of such assaults are socially unacceptable and punishable by law, whereas many acts of social aggression (e.g., peer exclusion) have much less serious consequences.

Moreover, because social forms of aggression do not necessarily identify the aggressor, it is possible to minimize the potential for retaliation from the victim, reduce the chances of being punished for the negative behavior by authority figures, and avoid appearing mean while harming other people's relationships (Merten, 1997; Xie, Swift, Cairns, & Cairns, 2002). Thus, conceptualized as a skillful form of anger expression, social aggression represents a potentially adaptive form of reactive aggression that theoretically might have concurrent associations with high levels of social competence.

In addition to the possibility that social aggression presents opportunities to skillfully express anger with reduced fear of recrimination, the use of social aggression may be particularly adaptive in the peer context because such behaviors are socially acceptable, perhaps even socially valued. Theoretically, it is true that this argument could also be made for physical aggression. Indeed, several studies have revealed that in particular developmental and cultural contexts, physically aggressive behavior may be linked to social competence and may serve a variety of potential normative and prosocial functions (e.g., Hawley, 2003; Hawley & Vaughn, 2003; Strayer & Noel, 1986). From a dyadic perspective, there has been some (inconsistent) evidence that overtly aggressive children may not differ from their nonaggressive peers in having reciprocated friendships (c.f., Cairns et al., 1989; Hektner, August, & Realmuto, 2000). With respect to social aggression, Rys and Bear (1997) found that socially aggressive children were as likely as nonaggressive children to have one or more reciprocated friendships.

Preliminary empirical findings from studies of children's friendships also suggest that the use of social aggression, but not overt aggression, is associated with positive friendship qualities. For example, Grotpeter and Crick (1996) reported that when compared to overtly

aggressive children, the friendships of socially aggressive children were characterized by higher concurrent levels of intimacy and personal disclosure. Thus, perhaps social aggression may prove functional in establishing and maintaining close friendships. It also may be argued that the advantages of social strategies are particularly salient for girls because physical expressions of anger are less gender normative (see Underwood, 2003 for a review). With respect to negative friendship qualities, recent findings reported by Cillessen, Jiang, West, and Laszkowski (2005) showed that self-reports of relational aggression were related to self-reports of negative friendship quality. However, these associations were not found for peer-reports of social aggression. Although there remains a paucity of empirical research addressing these questions, the theory underlying the frustration-aggression hypothesis may be useful in generating hypotheses about the relationship between emotional expression, friendship quality, and social aggression.

Interestingly, these ideas suggest that social aggression, more than physical aggression, should be associated with an advanced capacity for delayed gratification, greater (or at least temporary) frustration tolerance, and social nuance. The extent to which an individual responds to frustration with a social rather than a physical response suggests the presence of at least some adaptive social attributes. Note that even a response to frustration that is socially aggressive may not be considered as adaptive as a nonaggressive response. However, the possibility that social aggression may be associated with at least some adaptive attributes remains relatively untested. Of particular importance, the association between social aggression and adaptive functioning may be enhanced in the presence of social rewards for this form of behavior. This is described in more detail below.

In contrast to reactive aggression, proactive aggression is understood as aggressive behavior that is directed toward attaining a specific, self-serving goal (Dodge & Coie, 1987). Proactive aggression is cited in evolutionary models and ethological studies suggesting that aggressive behavior may be used to achieve any number of species-preserving functions (e.g., Lorenz, 1966). Extensions of this original ethological conceptualization of aggression (e.g., Daly & Wilson, 1988, 2003) recommend the consideration of aggression as an evolved adaptation to particular environmental and adaptive problems. As such, aggressive behavior is understood as a tactic used to pursue social goals that cannot be qualified as normal or abnormal (Anderson & Bushman, 2002).

A recent application of these ideas pertains to the use of aggressive behavior to establish social dominance. Hawley's (1999) resource control theory questions the hegemony of the aggression-maladaptation association by proposing that social competence requires a balance between agency and communion, and aggressive and prosocial interpersonal orientations. In contrast to ethological views of social dominance as aggressive behavior with impunity (e.g., Bernstein, 1981), Hawley (1999) defines social dominance as the result of effective use of resource control strategies. Specifically, resource control theory hypothesizes that some aggressive individuals employ only coercive strategies of resource control (e.g., threatening others), whereas others employ both coercive and prosocial strategies (e.g., promise reciprocation, cooperation). Hawley (2003) found that individuals who use both coercive and prosocial strategies, termed bistrategic controllers, do in fact benefit from greater resource control and social centrality as compared to individuals who use exclusively coercive or prosocial strategies. As such, bistrategic controllers are considered effective resource

controllers who generally have high status in the social network, enjoy a variety of positive personal outcomes, and are socially skilled (Hawley, 1999).

In applying resource control theory to understanding social aggression, several key differences with physical forms of aggression emerge. Indeed, researchers have proposed a conceptual link between social aggression and centrality in the social group by arguing that socially aggressive behavior is used to strategically manipulate the social world in ways that may be effective in achieving and maintaining popularity, such as representing social status by selectively associating with others (e.g., Cairns & Cairns, 1994; Underwood, Galen, & Paquette, 2001; Xie et al., 2002). To date, preliminary findings support this proposition. Consistent with the basic tenets of resource control theory, Hawley (2003) reported that children who acknowledged using both coercive and cooperative strategies in social interactions were liked by peers, socially skilled, and well-adjusted. In a large-scale study of fourth-grade girls, Rhule, Putallaz, Grimes, Kupersmidt, and McKnight (2001) reported that social aggression was significantly positively related to peer reports of social status and socially effective behaviors. Rose, Swenson, and Waller (2004) also found that reputation-based popularity was positively related to social aggression, even after controlling for positive bivariate relations between overt aggression and perceived popularity. Finally, Prinstein & Cillessen (2003) demonstrated that peer expert ratings of social/reputational aggression that was used proactively were positively related to reputation-based popularity, but not preference-based popularity. A similar pattern of associations between peer status and social aggression was reported by Cillessen and Mayeux (2004) in that social aggression predicted high social prominence but low social preference.

As a complement to ethological perspectives of proactive aggression, social learning models posit that individuals learn to aggress through modeling, direct operant reinforcement in the form of reward or punishment, and vicarious reinforcement through observational learning (Bandura, 1973). As such, patterns of aggressive behavior develop in a social context and may prove functional in acquiring specific social benefits. From this perspective, proactive aggression is believed to be reinforced by the rewards that the aggressive behavior was designed to elicit such as status or social dominance (Bandura, 1973, 1983). Support for this proposition was reported by Prinstein and Cillessen (2003) who found that the proactive use of aggression was associated longitudinally with high levels of popularity, suggesting that adolescents may perceive the use of such aggressive strategies as a means of maintaining status in the peer group.

In addition to the application of social learning principles to understanding potential instrumental functions, Xie et al. (2004) propose extending Bandura's concept of neutralization strategies to consider the function of socially aggressive behaviors. Specifically, Bandura (1973) believed that individuals address feelings of self-condemnation for their aggressive behavior by engaging in neutralizing strategies such as diffusion and displacement of responsibility, dehumanizing the victim, or justifying the aggression on the grounds of higher principles. Xie et al. (2004) suggest that social aggression may enable the aggressor to effectively neutralize self-condemnation through diffusion and displacement of responsibility when it is possible to conceal his or her identity within social networks.

In sum, not unlike work on reactive aggression, theories regarding proactive aggression suggest several pathways in which aggressive behavior (and socially aggressive behavior in particular) may be associated with adaptive correlates. To the extent that socially aggressive

behaviors exhibited through proactive means may indicate a form of resource control, assertion of dominance, and are rewarded within the social hierarchy, social aggression should be associated with some measures of high status and social skill.

The above review offers preliminary theoretical evidence to demonstrate that unlike physically aggressive behaviors, social aggression may be associated with adaptive, as well as maladaptive psychological correlates. This hypothesis has important implications for the conceptualization of socially "aggressive" behaviors as aggressive at all, and offers hope for new directions in the study of these unique behaviors

The present study was designed to examine socially aggressive behavior as a concurrent and prospective predictor of adaptive peer relationships at both the group and the dyadic levels. This analytic approach is consistent with a longstanding tradition of examining effects in multiple social and interpersonal contexts (Hartup, 1996). Group level peer experiences are focused on peer experiences and reputations within the overall social context (such as acceptance/rejection or popularity). Dyadic level peer experiences include participation in friendships, friendship stability, and the positive and negative friendship qualities of these relationships.

In this study, social aggression was examined as a predictor of two peer relations constructs at the group level: preference- and reputation-based popularity. For decades, group-level peer status has been defined as a preference-based construct, typically assessed by asking peers to nominate their preferred peers (those who are liked most or liked least) (Coie & Dodge, 1983). Substantial research suggests that peer acceptance/rejection is an important construct indicating the extent to which children are well-liked within the peer group (Coie & Dodge, 1983). Recently, a distinct reputation-based construct has been

developed to reflect youths' reputations of status and popularity at the group level (based on peer nominations of most- and least-popular) (Parkhurst & Hopmeyer, 1998). Similar to studies in sociology and human ethology, reputation-based popularity is thought to represent dominance and positions within the social hierarchy (Prinstein & Cillessen, 2003; Rose et al., 2004).

It was anticipated that social aggression, but not overt aggression, would be positively related to increases in reputation-based popularity in the peer group. In contrast, no significant associations were expected for changes in preference-based popularity (i.e., peer acceptance/rejection). It also was expected that associations between social aggression and peer status may vary, in part, on the functions served by aggression. Unfortunately, data regarding aggressive functions were not available. However, recognizing the potential functional heterogeneity of youths' aggressive behavior, curvilinear associations were examined. Specifically, it was anticipated that both high and low levels of socially aggressive behavior (i.e., reflecting perhaps excessive or sporadic uses of this form of aggression), would be associated with decreases in reputation-based peer status. No curvilinear effects for overt aggression were hypothesized. Interestingly, no prior work has examined longitudinal curvilinear associations of aggressive behavior on later group-level peer status.

In terms of dyadic effects, several hypotheses were offered relating to indices of friendship reciprocity, stability, and self- and friend-reported positive and negative friendship quality. As noted above, evidence has been mixed regarding associations between aggression and friendship reciprocity. Overt and social aggression may be associated with higher or lower likelihoods of establishing reciprocated friendships. Given the conceptualization of

social aggression as a possible intimacy-enhancing and relationship boundary-maintaining behavior, it was hypothesized that social aggression would be associated with closer friendships, as evidenced by a greater likelihood of friendship reciprocity. Yet, social aggression may have deleterious consequences for friendship in the long term. Specifically, it was hypothesized that social aggression would be associated with less friendship stability over time. Given mixed findings in past research, no specific predictions were offered for overt aggression as a predictor of friendship reciprocity and stability.

The potential for social aggression to function as a mechanism for enhancing some positive aspects of relationship quality, while also perhaps reflecting a tendency for intrarelationship conflict, suggested that social aggression would be uniquely associated with increases in both positive and negative friendship qualities (e.g., Crick & Grotpeter, 1996; Rys & Bear, 1997). In contrast, it was anticipated that overt aggression only would be associated with increased levels of negative friendship quality. This study also allowed for the examination of friendship quality, as reported by adolescents and their friends. It was hypothesized that social aggression, but not overt aggression, would be associated with increases in both adolescents' and friends' reported friendship qualities.

Several gender differences were anticipated. Prinstein and Cillessen (2003) reported that use of social aggression predicted increases in reputation-based popularity for girls, but not for boys. Similarly, Rose and colleagues (2004) found that social aggression predicted increases in perceived popularity over a six month period for girls, but not for boys. Accordingly, it was hypothesized that social aggression would only predict increases in reputation-based popularity for girls.

With respect to gender differences in the associations between aggression and friendship variables, several tentative hypotheses were offered. First, because past research has suggested that girls exhibit social aggression with a greater relational emphasis than do boys (Underwood, 2003), it was anticipated that the potential friendship benefits of social aggression would be greater for girls than for boys. Accordingly, it was hypothesized that gender would moderate the relationship between aggression and both self- and friend-reported friendship quality. No specific hypotheses were offered regarding moderational influences of gender on associations between aggression and friendship reciprocity or friendship stability.

This study was designed to contribute to the extant literature by addressing several key limitations of prior studies. An important contribution of this particular study was the use of longitudinal methods to examine prospective associations between social aggression, preference-and reputation-based popularity, and friendship quality. Additionally, strong significant relationships have been found between overt and social aggression (e.g., $r = .54$, Crick & Grotpeter, 1995; $r = .63$, Crick, 1997). As a result, this study included data on both overt and social aggression such that the statistical analyses allowed for an examination of the unique relation between each form of aggression while controlling for the other form. Third, in accordance with current developmental theory and methods, multiple reporters were used. For example, examining both self- and friend-reported friendship quality allowed for an extension of the work of Cillessen and colleagues (2005) that was focused on self-reports. Finally, this study extended the work of Rose et al. (2004) by including a sociometric approach that incorporated an unlimited nomination procedure. Terry (2000) has suggested that an unlimited nominations approach results in sociometric data with particularly reliable measurement properties.

# CHAPTER II

# STUDY METHODS

## *Participants*

Participants included 559 children and adolescents (50% females) in grades six (35%), seven (30%), and eight (35%) at the outset of the study. With respect to the ethnic composition of the sample, 87% were European American, 2% were African American, 4% were Asian American, 2% were Latino American, and 6% were of mixed ethnic backgrounds. Participants were enrolled in public schools within a city of fairly homogenous, middle class socioeconomic status (per capita income = $30, 220; Connecticut State Department of Education, 2000). According to school records, 11% of students were eligible for free or reduced price lunch.

At Time 1, all students were recruited for participation and consent forms were returned by 92% of families (n=784). Of these, 85% of parents gave consent for their child's participation (*n* = 666, 78% of the total population). Students who were absent on one of the testing days or who opted not to participate (*n* = 25) were not included in this study, yielding a final sample of 641 participants at Time 1. Data were collected 11 months later (i.e., Time 2) from a total of 559 of the initial participants (87%). Attrition was the result of participants moving away from the area, absenteeism, incomplete data, and refusal to continue participation in the study. Attrition analyses identified several significant differences between the 559 adolescents in the final sample as compared to the adolescents (*n* = 82) who did not complete the study. Specifically, adolescents who participated at both time points had lower

levels of overt aggression, *M* = -.11, SD = .82, and social aggression, *M* = -.07, SD = .82, than adolescents who did not participate at Time 2, Overt: *M* = .30, SD = 1.20; *t* (639) = 3.89, *p* < .001; Social: M = .21, SD = 1.09; *t* (639) = 2.73, *p* < .01. Adolescents who participated at both time points also had higher levels of reputation-based popularity, *M* = .07, SD = .98, than adolescents who did not participate at Time 2, *M* = -.29, SD = .99; *t* (614) = 2.98, *p* < .01. Finally, adolescents who participated at both time points had higher levels of preference-based popularity, *M* = .14, SD = .92, than adolescents who did not participate at Time 2, *M* = -.34, SD = 1.05; *t* (639) = 4.23, *p* < .001. No significant differences were revealed between the adolescents who participated at both time points and those who only participated at Time 1 on positive and negative self-reported friendship quality, or rates of friendship stability.

*Measures*

Measures of preference- and reputation-based popularity, peer nominations of forms of aggression, and friendship quality were administered at both time points.

Measures of peer status were obtained from standard sociometric procedures. Adolescents at the school were organized in academic teams, and each team was roughly twice the size of a traditional academic classroom. At an initial time point and again at Time 2, adolescents were presented with an alphabetized roster of all academic teammates. To control for possible effects of alphabetization on nominee selection, the order of names on the rosters was counterbalanced (e.g., Z through A). Adolescents were asked to nominate an unlimited number of peers whom they “liked the most” and “liked the least.” The number of nominations received for each item was used to compute a standardized score. A measure of preference-based popularity was then created by calculating the difference between

"like most" and "like least" standard scores and restandardizing this value. Higher scores of preference-based popularity indicate greater likeability among peers (Coie & Dodge, 1983). Additionally, adolescents were asked to nominate peers who were "most popular" and "least popular" (LaFontana & Cillessen, 1999; Parkhurst & Hopmeyer, 1998). Standardized nominations were computed for these items. Difference scores were computed and restandardized to represent levels of reputation-based popularity, with higher scores indicating that an adolescent was perceived by his or her classmates as having a higher reputation of popularity. Sociometric nomination procedures are believed to generate the most reliable and valid indices of peer status, and the procedure generates an ecologically-valid measure that is not influenced by adolescents' self-report (Coie & Dodge, 1983; Parkhurst & Hopmeyer, 1998).

To assess forms of aggression, an unlimited nomination procedure was completed using rosters of all academic teammates. Adolescents were asked to identify peers who exhibited overt and social forms of aggression. The mean score of results from two peer nomination items were used to index social aggression (e.g., "Who ignores classmates or stops talking to them to be mean?", and "Who spreads rumors or gossips about classmates to be mean?") and overt aggression (e.g., "Who starts fights?" and "Who gets mad and angry easily?") (Coie & Dodge, 1983; Prinstein & Cillessen, 2003). The mean scores for each form of aggression were then standardized.

In a manner consistent with prior research (e.g., Parker & Asher, 1993), a peer nomination procedure was used to assess adolescents' participation in best friendships. Adolescents were invited to select an unlimited number of "closest friends" from a roster of all academic teammates alphabetized by first name. From this list of "closest friends,"

adolescents were then asked to select a single “very best friend” as well as two additional “best friends.” The same procedure was repeated 11 months later at Time 2. Consistent with past research (Parker & Asher, 1993), friendships were considered to have been reciprocated if both members of the dyad reported one another as either a very best friend, or as a friend who was listed among the top three closest friends. Similarly, friendships were considered stable if the very best friend at Time 1 was nominated as one of the closest (i.e., top 3) friends at Time 2.

Adolescents were asked to complete the *Network of Relationships Inventory* (NRI; Furman, 1998) to assess various positive and negative qualities associated with their best friendship. The NRI was completed at both time points and the adolescent reported on his or her current best friendship. The NRI is comprised of 30 items (i.e., assessing companionship, intimacy, reliable alliance, emotional support, conflict, criticism, and dominance). Each domain is assessed with three items describing behaviors that occur within the relationship and participants respond to each item using a five-point Likert scale. The psychometric properties reported by Furman (1998) support the NRI as a reliable and valid measure of friendship quality. Factor analyses of the individual narrow-band domains consistently have identified two broad-band factors: positive friendship quality (companionship, intimacy, reliable alliance, emotional support) and negative friendship quality (criticism, dominance, conflict) (Furman, 1998). Adequate internal consistency for these subscales has been reported (alphas > .80), as well as satisfactory test-retest reliability over one month (*r* values of .66-.70) (Furman, 1998). Internal consistency for NRI items in the current sample was .92 and .93 for positive friendship quality and .79 and .83 for negative friendship quality at Times 1 and 2, respectively[0].

For friend-reported friendship quality, only reciprocal dyads were included in the analyses. This is because data were needed from both members of the dyad in response to items regarding the same relationship. However, data from each dyad member were available only for the single "very best friend" of each adolescent. Therefore, reciprocity of adolescents' very best friend selection was established by examining mutual friendship nominations. As such, analyses include participants who were in stable, reciprocal very best friendships at Time 1 and Time 2 ($n$=74). It is important to note that positive friendship qualities are assessed on the NRI as aspects of the relationship, whereas negative friendship qualities are assessed as features of the best friend (e.g., "How often does your best friend criticize you?"). Thus, both friend- and adolescent-reports of positive friendship qualities reflect perspectives of the same relationship (e.g., levels of positive friendship quality within the relationship). Friend- and adolescent-reports of negative friendship qualities represent each reporter's perspective on how much the friendship partner exhibits particular negative behaviors.

# CHAPTER III

# RESULTS

Means and standard deviations for all primary variables are presented in Table 1. T-tests to examine gender differences revealed higher levels of Time 1 overt aggression for boys as compared to girls, and higher levels of preference-based popularity and positive self- and friend-reported friendship quality for girls as compared to boys at both Times 1 and 2 (see Table 1).

Pearson correlations were conducted to examine bivariate associations among all study variables (see Table 2). For boys, significant associations were revealed both concurrently and longitudinally between low levels of preference-based popularity (i.e., peer rejection) and high levels of both forms of aggression (overt and social). A slightly different pattern emerged for boys' reputation-based popularity in that low levels of Time 1 reputation-based popularity were significantly associated with high levels of overt aggression. No associations were revealed between Time 1 reputation-based popularity and social aggression. At Time 2, high levels of boys' reputation-based popularity were associated with high levels of social, but not overt aggression. For girls, a consistent pattern of associations was observed at both time points. Specifically, low levels of preference-based popularity were significantly associated with high levels of overt, but not social aggression. High levels of girls' reputation-based popularity were significantly associated with high levels of social aggression at both time points. No association was revealed between girls' reputation-based popularity and overt aggression at either time point.

For dyadic friendship variables, no significant correlations were revealed between boys' self- or friend-reported measures of friendship quality (positive and negative) and aggression (social and overt) at either time point. A different pattern of associations emerged for girls. Specifically, high levels of Time 1 self-reported positive and negative friendship quality were significantly associated with high levels of both overt and social aggression. High levels of Time 2 self-reported positive and negative friendship quality were significantly associated with high levels of overt and social aggression with one exception; no association was revealed between Time 2 self-reported negative friendship quality and overt aggression. For friend-reported measures of friendship quality, significant associations were noted between high levels of Time 1 negative friendship quality and high levels of both overt and social aggression. At Time 2, high levels of friend-reported negative friendship quality were associated with high levels of social, but not overt aggression.

*Longitudinal Prediction of Peer Relations at the Group Level*

Two hierarchical multiple regressions were conducted to examine overt and social aggression as prospective predictors of each group peer relations construct (i.e., preference-based popularity, reputation-based popularity) within the full sample of participants (n = 559). In addition to testing linear associations between the group-level peer relations variables and both forms of aggression, curvilinear trends were examined in these models. The presence of curvilinear trends would suggest that both high and low levels of aggression may be associated with changes in preference- and reputation-based popularity.

Each model included Time 2 levels of (preference-based, reputation-based, respectively) popularity entered as a criterion variable, and corresponding Time 1 levels of popularity entered in an initial step. To examine the main hypotheses, both forms of aggression were

entered as predictors simultaneously in Step 2. The potential moderating effects of gender were tested by entering gender in Step 2 of the models, and entering an interaction term of gender and each predictor in a third step. The potential curvilinear associations then were tested by entering the quadratic terms of both predictors (overt and social aggression) simultaneously in a fourth step. Finally, the moderating effects of gender on the curvilinear associations were tested by entering an interaction term of gender and the quadratic predictor terms simultaneously in a fifth step (see Tables 3 and 4).

For preference-based popularity, results revealed significant linear and curvilinear associations between social aggression and changes in preference-based popularity after controlling for Time 1 preference-based popularity**.** In addition, gender emerged as a significant moderator of these linear and curvilinear effects. Holmbeck's (2002) guidelines for post-hoc probing of significant interactions were used to examine the nature of these interaction effects. These guidelines recommend first computing new product terms at different levels of the moderator variable (i.e., for boys and for girls). The new product terms were then used in the computation of simple slope estimates for "reduced" regression models (i.e., models that included only covariates and significant predictors). Finally, the statistical significance of the slopes was examined at different levels of the moderator variable. For the linear effect, post-hoc probing revealed a significant negative linear slope for boys, b = -.16, SE = .05, β = -.14, $p < .001$, indicating that higher levels of Time 1 social aggression were associated with decreases in preference-based popularity at Time 2, after controlling for initial levels of preference-based popularity. In contrast, no significant linear slope was revealed for girls, b = .03, SE = .05, β = .03, NS. Post-hoc probing of the curvilinear effect revealed a positive boys' slope that trended towards significance, b = .03, SE = .02, β = .10,

$p$ = .065. If statistically significant, this effect would suggest that both high and low levels of social aggression were associated with increases in Time 2 preference-based popularity. For girls, this slope was not significantly different from zero, b = .01, SE = .02, β = .03, NS. The combined presence of the linear and curvilinear trends suggested that the data were best fit by a J-shaped curve. For boys, lower levels of social aggression were associated predominantly with increases in preference-based status, although there is some subtle trend for high levels of social aggression also to be associated with increases in preference-based popularity. In addition, a significant moderated curvilinear term was revealed for overt aggression. Specifically, slopes suggested that both high and low levels of overt aggression were associated with increases in preference-based popularity for girls, $b$ = .16; SE = .06, β = .73, $p$ < .01, but not for boys, $b$ = .01; SE = .01, β = .04, NS.

To further qualify the nature of the curvilinear findings, scatterplots were examined for each effect. Specifically, for every model that had a significant curvilinear effect, unstandardized residuals were computed by regressing all of the variables from the initial model on the dependent variable of interest, with the exception of gender, the linear predictor term (i.e., social or overt aggression), the curvilinear predictor term (i.e., quadratic term of social or overt aggression), and the interaction terms for gender and each of the predictors. For example, to explore the curvilinear effect of social aggression on change in preference-based popularity, unstandardized residuals were computed by regressing Time 1 preference-based popularity, the linear term of overt aggression, the quadratic term of overt aggression, the interaction of the linear term of overt aggression and gender, and the interaction of the curvilinear term of overt aggression and gender. The unstandardized residuals were then plotted against the Time 2 preference-based popularity. The resulting plot was examined to

see whether the curvilinear effect was due to systematic variation in the data at either high or low levels of social aggression. A lowess fit line (i.e., denoted as the fit line at total on the plots) was plotted, as well as a projected curvilinear fit line.

With respect to the curvilinear findings of an association between social aggression and increases in preference-based popularity, visual inspection of the scatterplot (see Figure 2) suggested a slight effect of high levels of social aggression on increases in preference-based popularity. It should be noted, however, that this effect may be the result of a pattern of outliers in the data, such that the curvilinear finding is largely driven by a number of participants in the study who were rated as socially aggressive by the vast majority of their peers such that they are several standard deviations above the mean on social aggression. Similarly, the scatterplot of unstandardized residuals from the model of reputation-based popularity and overt aggression among girls revealed that the curvilinear effect was based on very few participants who were deemed highly socially aggressive in the peer nomination procedure (see Figure 3).

For reputation-based popularity, results indicated a significant positive linear effect of high levels of social aggression on increased levels of Time 2 reputation-based popularity after controlling for Time 1 reputation-based popularity (see β at step)**.** However, this linear effect no longer was significant after entering quadratic terms in the model. Both a main curvilinear effect of social aggression and a gender-moderated curvilinear effect of social aggression were longitudinally associated with change in Time 2 reputation-based popularity. The main effect indicated that both high and low levels of social aggression were associated with increased reputation-based popularity. Post-hoc probing revealed a significant positive curvilinear slope for boys, $b = .04$; SE = .01, $\beta = .11$, $p < .01$, but not for girls, $b = .01$;

SE = .02, β = .02, NS. A significant moderated curvilinear term also was revealed for overt aggression; however, significant slopes were not revealed for either girls or boys, all β's < .26, NS. Visual inspection of a scatterplot of the unstandardized residuals for the overall model and social aggression suggested that similar to the findings for preference-based popularity, the curvilinear effect for boys was only revealed for high levels of social aggression, and the effect was small in magnitude (see Figure 4).

*Longitudinal Prediction of Peer Relations at the Dyadic Level*

Six measures of peer relations at the dyadic level were examined in this study including friendship reciprocity, friendship stability, positive and negative self-reported friendship quality, and positive and negative friendship quality as reported by adolescents' best friends.

Friendship reciprocity was determined by examining mutual friendship nominations. A total of 149 adolescents selected a very best friend who was not in the dataset; therefore reciprocity could not be determined. Analyses revealed no significant differences between adolescents who did/did not select a very best friend who also was a study participant. Of the 410 adolescents at Time 1 for whom reciprocity data were available, 289 adolescents (71%) were part of a reciprocal best friendship at Time 1. A logistic regression was conducted to examine Time 1 aggression (overt and social) as predictors of friendship reciprocity. Friendship reciprocity was coded dichotomously (yes/no) based on whether an individual was in reciprocated friendship. Friendships were considered to have been reciprocated if both members of the dyad reported one another as either a very best friend, or as a friend who was among the top three closest friends. The friendship reciprocity indicator served as the dependent variable in a logistic regression analysis. Main effects of Time 1 overt and social aggression were entered on an initial step. The potential moderating effects of gender

were tested by entering gender on the initial step in the model as well, and entering an interaction term of gender and each predictor in the second step. To examine possible curvilinear effects, the quadratic terms for overt and social aggression were entered in the third step. Finally, the potential moderating effects of gender on the curvilinear effects were tested by entering an interaction term of gender and each quadratic term in the fourth step.

Step statistics are presented in Table 5. The overall model was statistically significant, $\chi^2$ (9) = 22.09, $p < .01$; -2 Log Likelihood = 475.38. A significant main effect suggested that higher levels of overt aggression were associated with a lower likelihood of friendship reciprocity, (see Wald at step). A marginal effect for gender was noted in that there was a trend for boys to evidence a lower likelihood of having a reciprocated friendship as compared to girls. A trend also was noted for the interaction between social aggression and gender. Specifically, a marginal effect was observed such that higher levels of social aggression among boys were associated with a lower likelihood of having a reciprocated friendship, b = -.60, SE = .21, Wald = 8.18, odds ratio = 1.51, $p < .01$, whereas no such trend was observed for the relationship between social aggression and friendship reciprocity among girls, b = .33, SE = .27, Wald = 1.49, odds ratio = .67, NS. There were no main effects of either of the quadratic predictors of overt and social aggression on friendship reciprocity. Similarly, there were no significant interaction effects for either of the quadratic predictors (overt and social aggression) x gender.

Of the 289 adolescents in a reciprocated best friendship at Time 1, 74 (26%; 43 girls, 31 boys) remained in a stable friendship with the same friend over time. A logistic regression was conducted to examine Time 1 aggression (overt and social) as predictors of friendship stability between Time 1 and Time 2. Friendship stability was coded

dichotomously (yes/no) based on whether an individual remained in a stable friendship with the same friend at both time points. The friendship stability indicator served as the dependent variable in a logistic regression analysis. A hierarchical multiple regression analysis similar to above was conducted to examine linear and curvilinear effects of overt and social aggression as prospective predictors of friendship stability.

Step statistics are presented in Table 6. The overall model was statistically significant, $\chi^2$ (9) = 17.03, $p < .05$; -2 Log Likelihood = 310.77. A marginal trend was revealed in that lower levels of social aggression were associated with an increased likelihood of maintaining a stable friendship. No other significant main effects or interactions were revealed.

Two hierarchical multiple regressions were conducted to examine overt and social aggression as prospective predictors of self-reported positive and negative friendship quality, respectively, within the full sample ($n$ = 559). Each model included Time 2 levels of self-reported (positive or negative) friendship quality entered as a criterion variable, and corresponding Time 1 levels of self-reported friendship quality entered on an initial step. To examine the main hypotheses, both forms of aggression were entered as predictors simultaneously in Step 2. The potential moderating effects of gender also were tested by entering gender in as an initial step in the models, and entering an interaction term of gender and each predictor in the final step (see Table 7).

Significant associations were observed between Time 1 and Time 2 positive self-reported friendship quality and also between Time 1 and Time 2 negative self-reported friendship quality. In addition, results indicated that gender (female) was significantly associated with increases in adolescents' Time 2 self-reported friendship quality after controlling for Time 1 positive friendship quality. Most relevant to study hypotheses, a significant curvilinear effect

was revealed for social aggression as a longitudinal predictor of decreases in positive friendship quality. Visual inspection of a scatterplot of the unstandardized residuals for the overall model for positive friendship quality and social aggression suggested that the curvilinear effect was only revealed for high levels of social aggression such that there was a slight decrease in positive friendship quality (see Figure 5). A significant curvilinear effect also was revealed for overt aggression as a longitudinal predictor of changes in negative friendship quality. Again, visual inspection of a scatterplot of the unstandardized residuals for the overall model for negative friendship quality and overt aggression suggested that the curvilinear effect was only revealed for high levels of overt aggression such that there was a slight decrease in negative friendship quality (see Figure 6).

This dataset allowed for a unique opportunity to examine friendship quality based on friends' report. Specifically, among adolescents in reciprocated friendships that remained stable between time points ($n$ = 74), it was possible to examine friends' NRI scores as an external report of friendship quality. Thus, for this subsample of participants, analyses were conducted to determine whether the forms of aggression were associated with changes in friendship quality as reported by friends. Models identical to the examination of self-reported friendship quality were conducted (see Table 8). Results revealed a significant curvilinear effect for social aggression on changes in positive friendship quality. Both high and low levels of social aggression were associated with decreases in positive friendship quality over time, as reported by adolescents' friends.

*Path Analysis*

To examine the hypothesized associations while accounting for covariation across both predictors and outcomes, path analyses were conducted using full information maximum

likelihood as implemented in Amos version 6.0 (Arbuckle, 2005). Based on the findings from the aforementioned correlation and regression analyses, a multiple-group (by gender) initial path analysis included all observed primary variables in the study (overt and social aggression, quadratic terms for overt and social aggression, preference- and reputation-based popularity, and self-reported friendship quality) (see Figure 1). Autoregressive paths were estimated for preference- and reputation-based popularity at Times 1 and 2, as well as for self-reported friendship quality at both time points. Paths were included for each hypothesized association, including the prediction of Time 2 peer status (preference- and reputation-based popularity) and dyadic friendship quality (positive and negative self-report) from Time 1 overt and social aggression. In addition to the linear effects of overt and social aggression, curvilinear effects were examined by entering the quadratic terms of overt and social aggression into the model as predictors. All exogenous variables were allowed to covary. Shared-method variance was modeled by allowing the error terms for Time 2 peer-reported reputation-based and preference-based popularity to correlate, and the Time 2 self-reported positive and negative friendship quality error terms to correlate. Because there was a theoretical basis to predict different patterns of associations across gender for each tested path, a multiple group analysis initially was conducted to yield separate, freely-varying estimates for boys and girls. The fit of the model (Model 1) was satisfactory, $\chi^2$ (32) = 60.10, $p < .002$; $\chi^2$ / df = 1.88; normed fit index (NFI) = .99, comparative fit index (CFI) = .99, root mean square error of approximation (RMSEA) = .04.

To examine whether the paths of Model 1 were moderated by gender, a fully constrained model was estimated in which paths were systematically fixed to be equal for girls and boys (Model 2). A chi-square difference test was conducted to determine whether the estimation of

fixed path coefficients for boys and girls significantly reduced model fit. Fit reliably decreased when fixing all paths by gender (see Table 9, Model 2). This indicated that specific paths in Model 1 may have needed to freely vary by gender (i.e., evidence of gender moderation). To identify sources of moderation, four models were then estimated in which the stabilities of each construct were constrained. Specifically, the stabilities of preference-based popularity, reputation-based popularity, positive self-reported friendship quality, and negative self-reported friendship quality were each constrained (Models 2a-2d). Model fit did not significantly decrease by fixing these paths. Thus, these four paths were fixed by gender and used as a new baseline for comparing other potentially moderated paths (see Model 2e). Next, sixteen models were estimated to test whether the effects of either linear or curvilinear effects of either form of aggression (overt and social) on 1) group-level peer status (preference- and reputation-based popularity) or 2) self-reported friendship quality (positive and negative) were moderated by gender. For each of these sixteen models, a chi-square difference test was conducted against Model 2e.

Results revealed a significant change in chi-square, indicating significantly decreased model fit when six specific paths were fixed across gender. Specifically, the effects of social aggression (both linear and quadratic terms) on preference-based popularity, social aggression (quadratic term) on reputation-based popularity, overt aggression (quadratic term) on preference- and reputation-based popularity, and overt aggression (quadratic term) on negative friendship quality were all moderated by gender (see results for Models 3a-3f in Table 9). Thus, Model 4 was specified with these six moderated paths allowed to freely vary and all non-moderated paths fixed for gender. Doing so did not significantly change decrease

the fit of the model as compared to Model 2e, $\chi^2$ (46) = 71.10, NS, $\chi^2$ / df = 1.55; NFI = .98, CFI = .99, RMSEA = .03, yet yielded a more parsimonious model.

Several additional steps were taken in attempts to further improve model fit, consistent with hypotheses and results from regression analyses above. Four nonsignificant paths were removed, including (1) the prediction of negative friendship quality from social aggression; (2) the prediction of positive friendship quality from overt aggression; (3) the prediction of negative friendship quality from the quadratic social aggression term; and (4) the prediction of positive friendship quality from the quadratic overt aggression term. Removal of these paths, individually and combined, did not offer significant improvement to model fit. As such, the final model retained all paths from Model 4, which subsequently was interpreted at the best fitting model for these data.

In addition to significant auto-correlations, statistically significant paths revealed several associations for each outcome measure. For preference-based popularity, results revealed that among boys, high levels of Time 1 social aggression negatively predicted Time 2 preference-based popularity. As noted above, inspection of a scatterplot of unstandardized residuals from the regression analyses suggested that the significant curvilinear association reflected a slight trend for high levels of social aggression to be associated with increased levels of Time 2 preference-based popularity for boys. Finally, a curvilinear association between Time 1 overt aggression and Time 2 preference-based popularity was revealed for girls, but not for boys. This finding was consistent with findings from the regression analyses, and visual inspection of a scatterplot of unstandardized residuals from the regressions indicated that this curvilinear effect was likely the result of a number of female participants who had very high levels of overt aggression.

For reputation-based popularity, a significant curvilinear effect was observed for boys which suggested that high and low levels of social aggression were associated with high levels of Time 2 reputation-based popularity. Again, visual inspection of the scatterplot of unstandardized residuals from the regression analyses indicated that the curvilinear effect for boys was only revealed for high levels of social aggression, and the effect was small in magnitude. No associations (linear or curvilinear) were noted between social aggression and either of the peer status variables for girls.

Both linear and curvilinear effects were revealed for the longitudinal prediction of positive friendship quality. These effects were generally not moderated by gender. Specifically, a linear effect suggested that high levels of Time 1 social aggression were significantly associated with high levels of Time 2 positive friendship quality for both boys and girls. Significant curvilinear effects also were revealed. Visual inspection of a scatterplot of the unstandardized residuals from the regression analyses suggested that the curvilinear effect held for high levels of social aggression such that there was a slight decrease in positive friendship quality. With regard to negative friendship quality, linear and curvilinear effects again were revealed for both boys and girls. Linear effects suggested that high levels of overt aggression were associated with high levels of Time 2 negative friendship quality for boys and girls. Again, visual inspection of a scatterplot of the unstandardized residuals for the overall model for negative friendship quality and overt aggression suggested that the curvilinear effect only held for high levels of overt aggression such that there was a slight decrease in negative friendship quality.

# CHAPTER IV

# DISCUSSION

The emergence of a growing research literature exploring parallels between physical and social forms of aggression has raised many questions about the developmental effects of aggressive behavior on psychological functioning and on peer relationships. Although both forms of aggression have been linked to peer rejection in childhood and adolescence, more recent findings have highlighted the importance of considering the possible social rewards conferred by social aggression in peer groups and dyadic friendships (e.g., Cillessen & Mayeux, 2004; Prinstein & Cillessen, 2003). Accordingly, this study considered adaptive longitudinal correlates of socially aggressive behavior by examining associations between peer-reported social aggression and several key peer status and friendship variables.

Results provided mixed support for the central hypothesis of this study. Specifically, it was hypothesized that social aggression would be associated with social benefits at both group and dyadic levels. At the group level, it was hypothesized that social aggression would be related to increases in reputation-based popularity, but not preference-based popularity. It was further anticipated that this effect would be moderated by gender such that there would be a more pronounced effect for girls. Consistent with past research (i.e., Cillessen & Mayeux, 2004), analyses offered preliminary evidence of social aggression as a prospective predictor of increases in reputation-based popularity; however, results indicated that this association was moderated by gender in the opposite direction than was hypothesized. Specifically, curvilinear effects were explored to determine whether a

significant proportion of variance in the changes in reputation-based popularity could be explained after accounting for the linear effects. Results revealed a slight curvilinear effect for boys such that high levels of social aggression were positively related to increases in reputation-based popularity. The same pattern of associations was revealed for preference-based popularity in that high and low levels of social aggression were longitudinally associated with increases in preference-based popularity for boys, but not for girls. Thus, results provide support for the hypothesis that for boys, being highly socially aggressive may contribute to social centrality and likeability in the peer group. However, it is important to consider that the scatterplots revealed that the curvilinear effects of boys' social aggression on peer status were largely the result of a number of highly socially aggressive boys. Given this, replication of these findings for highly socially aggressive boys is warranted to determine whether there is indeed a subset of boys that warrants future study.

It is important to note that the findings from the present study regarding associations between peer status and aggression are inconsistent with results from several other studies (e.g., Cillessen & Mayeux, 2004; Rose et al., 2004). For example, Rose and colleagues (2004) reported that social aggression predicted reputation-based popularity over time for girls, but not for boys. Cillessen and Mayeux (2004) found a similar effect that held for both boys and girls, albeit more strongly for girls. Given these discrepancies, interpretations of the results of this study are made cautiously. It may be the case that because the path model allowed for greater control of the effects of all variables, the different pattern of results for social aggression reflects the fact that reputation-based popularity was being examined in the context of preference-based popularity and vice versa. Thus, it could be that after controlling

for shared variance between the predictors, what remains in the peer status constructs is somewhat different for girls and boys.

Recent findings provide support for this interpretation in that there is evidence the two peer status constructs become increasingly differentiated over time, and that this differentiation is particularly marked for girls (Cillessen & Mayeux, 2004). As such, compared to boys, it may be more difficult for girls who are perceived as popular to simultaneously maintain high likeability in the peer group. It also is possible that the meaning of social aggression is different for boys than for girls in that behaviors defined as socially aggressive may be generally perceived as more playful or teasing among boys than girls, and judgments about the intent of social aggression may meaningfully differ across gender. It follows that clarifying the nature of associations between social aggression and peer status may require understanding the potential moderational influence of the social context and the complex dynamics of peer affiliations in the social network (e.g., Stormshak et al., 1999). For example, research on peer group norms has demonstrated that overtly aggressive behavior does not have detrimental effects on the establishment and maintenance of friendships in environments where aggression is perceived as an acceptable strategy for ensuring self-protection and attaining instrumental goals (e.g., Cairns, Neckerman, & Cairns, 1989; Giordano, Cernkovich, & Pugh, 1986). With respect to aggression and preference-based popularity, there is empirical evidence that peer acceptance for particular social behaviors, including overt aggression, is influenced by peer group norms such that children who display high levels of nonnormative behavior will be at risk of rejection from the peer group (e.g., Boivin, Dodge, & Coie, 1995; Wright, Giammarino, & Parad, 1986). As such, perhaps associations between peer status and social aggression are in fact moderated by peer

group norms such that the perceived acceptability of socially aggressive behavior within a given group may have an important moderating influence.

The study of associations between aggression and group-level peer status has benefited considerably from drawing a distinction between the constructs of reputation- and preference-based popularity. Indeed, being perceived as popular by peers is only moderately related to being liked (e.g., LaFontana & Cillessen, 1999; Parkhurst & Hopmeyer, 1998). As a consequence, research efforts aimed at addressing mechanisms through which aggressive behaviors may enhance or detract from peer status are well-advised to consider this important distinction. Moreover, recent findings have emphasized the bidirectional relationships between social status and aggression, and how the nature of these bidirectional relations may vary by age and gender (i.e., Rose et al., 2004). Although an examination of reciprocal associations (i.e., popularity predicting aggression) was beyond the scope of this study, there is preliminary evidence that whereas social aggression may reciprocally influence reputation-based popularity for adolescent girls, adolescent boys' social aggression may be more of an outcome of reputation-based popularity than a cause (Cillessen & Mayeux, 2004; Rose et al., 2004; Zimmer-Gembeck et al., 2005). This differential association may reflect the fact that social aggression is considered less gender-normative for boys than girls, and as such, it is likely that engaging in socially aggressive behavior would not lead to increases in reputation-based popularity for boys. Findings further suggest there may be developmental differences in the temporal ordering of these causal associations for boys and girls (Rose et al., 2004). Specifically, Rose et al. (2004) reported that positive associations between aggression and reputation-based popularity were observed for seventh- and ninth-grade girls, but not for third- and fifth-grade girls. These results support the proposal that the strategic employment

of social aggression requires advanced interpersonal and social-cognitive skills that are not well-developed in younger children. Given the potential salience of both gender and developmental factors in appreciating the associations between aggression and peer status, perhaps the results of the present study did not replicate other longitudinal findings because the data were collected at arbitrarily selected time points and bidirectional relations were not considered in the analyses.

Similar to the findings for social aggression, results for overt aggression were inconsistent with prior research. Indeed, given that a substantive research literature has identified overt aggression as a robust correlate of low peer rejection (see Coie & Dodge, 1998; Underwood, 2002), it is curious that high levels of overt aggression did not predict decreased peer acceptance in this study. One possibility is that overt aggression may become more acceptable in the peer group as adolescents get older. Cillessen and Mayeux (2004) reported that the negative effect of overt aggression on likeability progressively decreased from age 10 to 14, and that this decrease was most pronounced for girls. Although the association remained negative, Cillessen and Mayeux (2004) proposed that adolescents may be more accepting of antisocial behavior as they progress through middle school. Moreover, the larger social contexts of middle school and high school could present increased opportunities for adolescents to befriend overtly aggressive peers. Accordingly, it is possible that the positive association between overt aggression and preference-based popularity may be mediated by nominations of reciprocal preference in small groups and cliques of overtly aggressive peers. A second potential explanation of the finding is that being well-liked (i.e., high preference-based popularity) may have been established much earlier in the social network, such that for adolescent girls who have been historically well-liked, the negative

consequences of engaging in overtly aggressive behavior may be buffered by a history of having been highly accepted in the peer group.

Overall, results offered mixed support for the study hypotheses related to peer status. Several findings were unanticipated and inconsistent with hypotheses and findings from prior investigations. For instance, based on the results of several prior studies, no associations were predicted between social aggression and changes in preference-based popularity; however, results indicated a significant linear effect for boys. It should be noted that although results attained statistical significance, the size of the effects were generally small in magnitude and as such, caution must be exercised when interpreting these findings. In addition, it is important to note that the present study was designed to examine residual change from Time 1 to Time 2 on the outcome measures. Given the relatively high stabilities of the peer status constructs in particular, it is possible that the results are inconsistent with findings from prior studies because there is limited variance remaining in preference- and reputation-based popularity after accounting for initial levels of each form of peer status. The remaining variance may be better explained by examining the bidirectional associations between the constructs, rather than simply focusing on the unidirectional prediction of status from aggression. Despite the relatively small effect sizes and focus on residualized change in the outcome variables, results do highlight the complex nature of associations between preference-based popularity (i.e., peer acceptance/likeability), reputation-based popularity (i.e., peer-perceived popularity), and aggression.

As a complement to examining the potential rewards of social aggression at the group-level, the effects of both forms of aggressive behavior on friendship reciprocity, friendship stability, and friendship quality were examined. Consistent with the results of some past

research, adolescents who were highly overtly aggressive were less likely to be in a reciprocated friendship (e.g., Hektner et al., 2000). No association between social aggression and friendship reciprocity was observed for boys; however a negative trend was noted for boys whereby high levels of social aggression were related to a decreased likelihood of having a reciprocated friendship. One possible explanation of this finding is that social aggression may be perceived as gender nonnormative behavior for boys in some peer contexts. As such, it may be that there are negative consequences for friendship reciprocity in environments that do not reward social aggression among boys. This interpretation is consistent with the research cited above on how peer group norms may moderate the relationship between aggression and peer status.

It is interesting to note that, consistent with findings reported by Rys and Bear (1997), there was no effect of social aggression on the likelihood that socially aggressive girls had reciprocated friendships. Although speculative, this finding may provide preliminary evidence of the social benefits associated with social aggression for girls. Given that the success of many socially aggressive behaviors (e.g., spreading rumors, social exclusion) depends on the participation of other peer group members, it would seem that having at least one reciprocated relationship is necessary for engaging in social aggression. It also is possible that for girls, social aggression may serve an important role in establishing and maintaining reciprocated friendships. Support for this proposition may be drawn from research conducted on negative evaluation gossip, arguably a form of social aggression. For example, Gottman and Mettetal (1986) contend that sharing negative evaluation gossip provides a means of establishing a sense of solidarity among friends. It is further argued that gossip exchanges among friends may represent bids for emotional closeness. As such, when

gossip is validated or positively reinforced by a friend, the initial speaker may experience increased feelings of inclusion and trust, and a decreased sense of vulnerability. This reduced vulnerability may in turn promote self-disclosure, emotional intimacy, and positive affect in the friendship. Thus, perhaps some forms of social aggression are effective in the initiation and, to some extent, maintenance of friendships for girls.

An alternative explanation may be that adolescents who demonstrate well-developed social skills are able to both maintain friendships and use social aggression successfully. Indeed, it is possible that for some individuals, social aggression covaries with other adaptive social behaviors. There is evidence that peer ratings of social aggression are positively correlated with social intelligence (i.e., possessing strong social cognitive skills, able to accomplish social goals) (Kaukiainen et al., 1999). These findings are consistent with the ethological perspective detailed in Hawley's (1999) resource control theory. Specifically, Hawley (1999, 2003) has argued that individuals who balance prosocial and coercive strategies are socially central and dominant in the peer group, and also possess the social skills generally associated with emotional intelligence. It follows that clarifying the mechanisms through which socially aggressive behavior is reinforced in dyadic relationships will inform current conceptualizations of the developmental trajectories of social aggression.

Interestingly, results for friendship stability revealed a trend in which high levels of social aggression were predictive of friendship dissolution for both boys and girls. Thus, it seems that socially aggressive behavior may confer some benefits in the shorter-term for friendships, but may present high costs for the long-term stability of those friendships. Specifically, perhaps being socially aggressive serves a function in the initiation and, to some extent, maintenance of relationships for girls. A relatively longstanding history of qualitative

sociological and anthropological research has demonstrated the positive functions of negative evaluation gossip in the communication of social information, clarification of social norms, and promotion of group cohesion (Eder & Enke, 1991; Eder & Sanford, 1986; Fine, 1986; Illich, 1982). Indeed, shared social evaluations of an absent third party may increase solidarity and intimacy in a relationship by creating a "we-against-them" climate (Beisner, 1989; Eckert, 1990; Gottman & Mettetal, 1986; Rysman, 1977; Suls, 1977). Given that it has been argued that social aggression increases social prominence through its effects on dyadic friendships (i.e., Cillessen et al., 2005), it follows that attention to relational dynamics, as well as to the social and developmental contexts in which social aggression occurs, is critical to understanding potential prosocial functions of socially aggressive behavior at the group level. As such, it could be that for some individuals, the perceived benefits of enhancing social status at the group-level outweigh the possibility that social aggression will ultimately compromise the long-term stability of a given friendship.

With respect to friendship quality, results supported a linear effect of social aggression on increases in positive self-reported friendship quality for both boys and girls. A relatively small curvilinear effect was observed with high levels of social aggression predicting decreases in positive friendship quality over time; however, evidence from the scatterplot suggested that this was in fact a very modest finding. These results offer mixed support for the study hypotheses. Specifically, it was anticipated that social aggression, but not overt aggression, would predict increases in positive friendship quality over time. It was further hypothesized that this effect would be particularly true for girls. Again, given the relatively small magnitude of the effects, interpretations must be made with caution. To date, few studies have examined the effects of social aggression on changes in friendship quality.

Cillessen et al. (2005) reported that within reciprocated friendships, peer nominations of social aggression did not predict positive friendship quality for either boys or girls, but did predict self-reports of higher friendship conflict for boys. It is interesting to note that Cillessen et al. (2005) found that peer nominations of social aggression were not correlated with self-reported friendship quality, whereas self-ratings of social aggression were in fact correlated with both positive and negative friendship quality. Because it was determined that this finding was not entirely the result of a lack of shared variance between peer nominations and ratings of friendship quality, Cillessen et al. (2005) proposed that the lack of correlation is evidence that social aggression may function as a "double-edged sword" in friendships. This contention garners support from ethological and social learning theories which suggest that the negative consequences associated with aggressive behavior are coupled with seemingly paradoxical advantages, including increased attention to the aggressor's needs and ascension of dominance in the peer group. Although results from the present study do not provide direct support for this proposition, it is an intriguing possibility.

The modest curvilinear effect for social aggression on change in positive friendship quality may provide preliminary evidence that at the dyadic level, there are benefits associated with engaging in moderate levels of social aggression. The focus of most studies on linear associations between aggression and group- and dyadic-level variables has made important contributions to the literature; however, perhaps moderate levels of peer-nominated social aggression reflect more skillful use of socially aggressive strategies. It also is possible that from a methodological perspective, the use of peer-nominated social aggression presents a challenge to clarifying the nature of associations between more skillful, nuanced socially aggressive behaviors and friendship quality. While it is widely

acknowledged that peer nomination procedures reliably identify individuals who are highly overtly and socially aggressive, it may be that there are highly socially aggressive individuals who are extremely effective in the use of covert behaviors such that they are less likely to be identified as social aggressors by a network of peers. Conversely, perhaps individuals who are identified as highly socially aggressive through peer nominations are generally less effective in their use of the behaviors. If this were indeed true, it follows that as compared to their more skillful counterparts, these individuals may be less likely to reap the social rewards associated with social aggression.

To what extent peer nomination procedures may conflate aggressive behaviors that are covert and skillful with behaviors that are more direct and perhaps less effective raises an issue of critical importance in the study of human aggression, namely the problem of confounding form (i.e., how an individual aggresses) and function (i.e., why an individual aggresses). Unfortunately, the majority of previous studies have not elaborated differences between the form and function of socially aggressive behavior. The lack of a functional perspective presents several significant limitations to the current conceptualization of socially aggressive behavior. For example, perhaps in some contexts, social aggression presents an outlet for the expression of negative affect, as well as a means of regulating emotional distress. Underwood (2003) suggests that socially aggressive attempts to harm another person's relationships may also represent a strategy for coping with the subjective experience of anger and frustration. As such, consistent with the frustration-aggression hypothesis, social forms of aggressive behavior may serve as a means of channeling the expression of anger and coping with negative affect through validation and support from a friend. Thus, rather than simply being construed as an attempt to manipulate relationships or cause social harm,

social aggression aimed at excluding others may promote an individual's own sense of belonging or reflect an appropriate assertion of autonomy in a given developmental stage (Paquette & Underwood, 1999). Although results of the present study do not specifically support or discredit these ideas, it is true that consideration of social aggression from a functional perspective may clarify the nature of associations among socially aggressive behavior, group-level peer status, and friendship quality. Thus, perhaps different forms of social aggression (i.e., sharing gossip in the context of a friendship, publicly excluding a peer from the group) are differentially predictive of adaptive and maladaptive outcomes. If this were indeed the case, associations between social aggression and adaptation may be clarified by considering the function served by the behavior. Given that this study examined social aggression as a homogenous construct, perhaps the effects predicted in theory were obscured by the fact that no information was available to address differences in the functions of socially aggressive behavior.

In sum, results offered mixed support for the central hypothesis that social aggression would be related to increases in both positive and negative friendship quality over time. Although there was a positive linear effect of high levels of social aggression on changes in self-reports of positive friendship quality, there was a slight curvilinear trend in the negative direction. Findings highlight the importance of exploring curvilinear effects given the heterogeneity of adolescents who engage in aggressive behavior and the apparent complexity of associations between social status, friendship quality, and aggression. Although the curvilinear effects were opposite to what was hypothesized, it is possible that the findings reflect the fact that the reports are based on the adolescents' perceptions of their friendships, rather than actual relationship effects. In addition, consideration of both the form and the

function of aggressive behaviors will likely generate a more complete understanding of these bidirectional relationships.

This investigation provides an important extension of prior work by examining unique associations between overt and social aggression, peer status, and friendship quality over time. The inclusion of curvilinear effects in the analyses offers new insight regarding the differential status correlates of high and low levels of aggressive behavior, and also provides preliminary information about the potential benefits of moderate levels of social aggression. Finally, this study contributes to ongoing research efforts aimed at addressing the nature of gender differences in socially aggressive behavior. Although several of the paths examined were moderated by gender, there was evidence to suggest that social aggression represents a behavioral strategy employed by both boys and girls.

*Limitations and Future Directions*

Future research would benefit by addressing several key limitations of the present study. For instance, the current study relied on established self-report measures of friendship quality and peer-nomination measures of aggression. Although research involving self- and peer-report methodologies clearly offers a significant contribution to the literature, such methods present inherent limitations. For example, peer nomination measures of aggression are premised on the assumption that aggressive behavior is a trait-like characteristic that is consistent across social situations. Moreover, given that social aggression may be confrontational (e.g., publicly excluding a peer from the social group) or nonconfrontational (e.g., character defamation, gossip), peer nomination measures of social aggression may identify social aggressors who typically engage in confrontational behaviors such that they are more likely to be nominated within the peer group. It also is possible that peer

nominations may identify individuals who are perhaps less skillful in their strategic use of nonconfrontational aggressive behaviors. Accordingly, peer nomination methodologies may present challenges to understanding the nature of associations between more nuanced and skillful social aggression and social-psychological adjustment. Perhaps consideration of peer nominations from within friendship dyads (i.e., friend-report) would provide a useful strategy for assessing social aggression in that informants would be privy to socially aggressive behaviors that may not have been known to all group members.

To address the potential limitations of peer nomination measures, a multi-method, multi-informant assessment of social aggression, including sociometric data and self- and friend-reports, would provide an important improvement in future research. Moreover, to generate a more comprehensive understanding of why social aggression may be positively associated with various adaptive outcomes and friendship qualities, closer examination of the interpersonal context will provide insight into the mechanisms that underlie the positive associations. An observational methodology designed to study the social processes and contexts in which the behavior occurs may provide important information about the various functions served by social aggression in dyads or groups (Parker & Gottman, 1989). Although it has been argued that observing social aggression in a laboratory setting may be extremely difficult or invalid because the behaviors being observed are often subtle and may require considerable knowledge about the peer group to be correctly interpreted, more recent research has revealed that it is possible to observe and reliably code socially aggressive behaviors using a paradigm similar to that of Feshbach (1969) in which pairs of friends interact with a peer confederate (e.g., Galen & Underwood, 1997). Given that social

aggression is an interpersonal phenomenon involving behaviors embedded in a social context, it is imperative that studies begin to include observational analyses.

Future research that employs innovative methodologies to study social aggression would provide important information regarding the different functions served by the behaviors in particular social contexts. A more elaborated functional perspective would greatly enhance current conceptualizations of socially aggressive behavior. To this end, future studies also would benefit from exploring the role of developmental stage in functional models of peer aggression. It is widely acknowledged that the form and function of aggression change over time, and that such changes result from both maturational factors within the child and emergent changes in social interactions and environmental expectations (Pepler & Craig, 2005). As children develop more advanced social and verbal skills in the preschool period, a decline in physically aggressive behaviors is observed and children are more likely to use verbally and socially aggressive strategies (Bjorkqvist, Osterman, & Kaukiainen, 1992). Studies of aggressive behavior in particular developmental contexts have revealed a variety of potential normative and prosocial functions (e.g., Hawley & Vaughn, 2003). As such, it is important that the focus on negative psychological and behavioral outcomes does not preclude the possibility that in certain social and developmental contexts, social aggression may be associated with adaptive outcomes.

In sum, results from this study underscore the complex nature of the associations that exist among overt and social aggression, peer status, and friendship quality. The findings contribute to a growing scientific literature aimed at identifying concurrent correlates and longitudinal outcomes associated with socially aggressive behavior. Studies to date have made considerable progress in clarifying important differences between social and overt

forms of aggressive behavior; however, continued efforts to refine definitions of social aggression and examine how existing theories of human aggression might best inform conceptualizations of the construct are clearly warranted. Although the study of social aggression is complicated by the challenge of assessing behaviors that may be covert and are necessarily embedded in a social context, knowledge of the functions and development of socially aggressive behavior will significantly advance our understanding of when the behaviors reflect prosocial, normative adaptation, and when the behaviors represent markers of maladaptation and adjustment difficulties.

Table 1:

Means and Standard Deviations for Primary Variables

| | Boys | Girls | *t* (557) |
|---|---|---|---|
| Time 1 | | | |
| Overt Aggression | .06 (1.08) | -.28 (.36) | 4.87** |
| Social Aggression | -.05 (.84) | -.09 (.81) | < 1 |
| Preference-based Popularity | .04 (.98) | .25 (.83) | 2.71* |
| Reputation-based Popularity | .05 (1.00) | .10 (.95) | < 1 |
| Dyadic Friendship Quality, self-report | | | |
| Positive | 3.21 (.85) | 3.84 (.80) | 8.91** |
| Negative | 1.56 (.44) | 1.52 (.47) | 1.13 |
| Dyadic Friendship Quality, friend-report (n=74) | | | |
| Positive | 3.32 (.81) | 4.11 (.65) | 4.67** |
| Negative | 1.48 (.33) | 1.58 (.39) | 1.16 |
| Time 2 | | | |
| Preference-based Popularity | .00 (1.04) | .17 (.83) | 2.14* |
| Reputation-based Popularity | .06 (.98) | .01 (.95) | < 1 |
| Dyadic Friendship Quality, self-report | | | |
| Positive | 2.99 (.81) | 3.74 (.75) | 11.30** |
| Negative | 1.56 (.51) | 1.50 (.48) | 1.33 |
| Dyadic Friendship Quality, friend-report (n=74) | | | |
| Positive | 3.19 (.72) | 4.06 (.77) | 4.91** |
| Negative | 1.52 (.46) | 1.54 (.46) | < 1 |

* $p < .05$; ** $p < .001$

Table 2: Bivariate Associations Among Primary Variables

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time 1 | | | | | | | | | | | | | | |
| 1. Overt Aggression | - | .73 | -.52 | -.16 | .07 | .02 | -.18[a] | .31[a] | -.53 | -.12 | .08 | .07 | -.19[a] | .07[a] |
| 2. Social Aggression | **.58** | - | -.36 | .07 | -.01 | .08 | .27[a] | -.04[a] | -.38 | .13 | .07 | .12 | .05[a] | .12[a] |
| 3. Pref-based Popularity | **-.21** | **-.05** | - | .70 | .07 | -.09 | .31[a] | .01[a] | .75 | .61 | .16 | -.04 | .11[a] | -.02[a] |
| 4. Rep-based Popularity | **.02** | **.41** | **.66** | - | .16 | -.02 | .47[a] | .02[a] | .52 | .86 | .25 | .11 | .14[a] | .24[a] |
| 5. Positive FQ (self) | **.13** | **.23** | **.00** | **.17** | - | .23 | .31[a] | -.23[a] | .06 | .14 | .60 | .08 | .15[a] | .25[a] |
| 6. Negative FQ (self) | **.18** | **.19** | **-.04** | **.11** | **.06** | - | -.15[a] | -.22[a] | -.09 | .03 | .12 | .31 | -.19[a] | -.18[a] |
| 7. Positive FQ (friend) | **.04**[b] | **.25**[b] | **.06**[b] | **.02**[b] | **.27**[b] | **-.16**[b] | - | .04[a] | .24[a] | .56[a] | .16[a] | .25[a] | .64[a] | .19[a] |
| 8. Negative FQ (friend) | **.33**[b] | **.31**[b] | **.04**[b] | **.25**[b] | **-.13**[b] | **.46**[b] | **-.18**[b] | - | -.12[a] | -.02[a] | -.30[a] | -.23[a] | -.01[a] | .28[a] |
| Time 2 | | | | | | | | | | | | | | |
| 9. Pref-based Popularity | **-.14** | **.00** | **.71** | **.56** | **.00** | **-.05** | **.02**[b] | **-.17**[b] | - | .61 | .10 | -.02 | .10[a] | -.10[a] |
| 10. Rep-based Popularity | **.03** | **.38** | **.59** | **.89** | **.12** | **.11** | **.14**[b] | **.30**[b] | **.58** | - | .22 | .14 | .23[a] | .24[a] |
| 11. Positive FQ (self) | **.15** | **.20** | **.06** | **.15** | **.52** | **-.01** | **.19**[b] | **-.08**[b] | **.10** | **.15** | - | .22 | -.09[a] | .10[a] |
| 12. Negative FQ (self) | **.07** | **.13** | **-.08** | **.07** | **.07** | **.31** | **-.10**[b] | **.01**[b] | **-.02** | **.08** | **.00** | - | .14[a] | -.10[a] |
| 13. Positive FQ (friend) | **.04**[b] | **.15**[b] | **.15**[b] | **.23**[b] | **.14**[b] | **-.12**[b] | **.38**[b] | **-.49**[b] | **.19**[b] | **.13**[b] | **.28**[b] | **.07**[b] | - | .03[a] |
| 14. Negative FQ (friend) | **.07**[b] | **.34**[b] | **-.15**[b] | **.08**[b] | **.02**[b] | **.01**[b] | **.14**[b] | **.39**[b] | **.09**[b] | **.14**[b] | **.11**[b] | **.06**[b] | **-.24**[b] | - |

*Note*. [a] includes 31 males with stable, reciprocal best friendships at Time 2, $r \geq |.44|$, $p < .05$; [b] includes 43 females with stable, reciprocal best friendships at Time 2, $r \geq |.31|$, $p < .05$. All other unbolded values represent correlations for boys, $r \geq |.12|$, $p < .05$. All other bolded values represent correlations for girls, $r \geq |.13|$, $p < .05$.

Table 3:

Longitudinal Prediction of Preference-Based Popularity by Aggression and Gender

| | Time 2 Preference-Based Popularity | | | | |
|---|---|---|---|---|---|
| | | Step Statistics | | Final Statistics | |
| Predictors | $\Delta R^2$ | b (se b) | β | b (se b) | β |
| Step 1 | .55*** | | | | |
| T1 Preference-based Popularity | | .77 (.03) | .74*** | .72 (.03) | .70*** |
| Step 2 | .01*** | | | | |
| Gender (female) | | -.03 (.06) | -.02 | .01 (.07) | .01 |
| Overt Aggression | | -.17 (.05) | -.15*** | -.05 (.10) | -.04 |
| Social Aggression | | .03 (.04) | .02 | -.31 (.10) | -.27** |
| Step 3 | .00 | | | | |
| Overt Aggression x Gender | | .14 (.14) | .04 | -.19 (.19) | -.06 |
| Social Aggression x Gender | | .06 (.09) | .03 | .43 (.13) | .26*** |
| Step 4 | .01* | | | | |
| Overt Agg (quadratic) | | .00 (.02) | .00 | -.03 (.02) | -.11 |
| Social Agg (quadratic) | | .05 (.02) | .13* | .11 (.03) | .31*** |
| Step 5 | .01*** | | | | |
| Overt Agg (quadratic) x Gender | | | | .21 (.08) | .10* |
| Social Agg (quadratic) x Gender | | | | -.14 (.04) | -.28*** |

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4:

Longitudinal Prediction of Reputation-Based Popularity Aggression, and Gender

| | Time 2 Reputation-Based Popularity | | | | |
|---|---|---|---|---|---|
| | Step Statistics | | | Final Statistics | |
| Predictors | $\Delta R^2$ | b (se b) | β | b (se b) | β |
| Step 1 | .76*** | | | | |
| T1 Reputation-based Popularity | | .86 (.02) | .87*** | .86 (.02) | .87*** |
| Step 2 | .01** | | | | |
| Gender (female) | | -.10 (.04) | -.05* | -.10 (.06) | -.05 |
| Overt Aggression | | -.02 (.03) | -.02 | .04 (.08) | .03 |
| Social Aggression | | .07 (.03) | .06* | -.05 (.07) | -.04 |
| Step 3 | .00 | | | | |
| Overt Aggression x Gender | | .05 (.10) | .01 | -.16 (.14) | -.05 |
| Social Aggression x Gender | | -.10 (.07) | -.06 | .13 (.10) | .08 |
| Step 4 | .00 | | | | |
| Overt Agg (quadratic) | | .00 (.01) | -.02 | -.02 (.01) | -.09 |
| Social Agg (quadratic) | | .03 (.01) | .08* | .07 (.02) | .19*** |
| Step 5 | .00** | | | | |
| Overt Agg (quadratic) x Gender | | | | .13 (.06) | .06* |
| Social Agg (quadratic) x Gender | | | | -.09 (.03) | -.16** |

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 5:

Logistic Regression Results for Friendship Reciprocity

| | Friendship Reciprocity | | | | |
|---|---|---|---|---|---|
| | Step Statistics | | | Final Statistics | |
| Predictors | $\chi^2$ Δ (df) | b (se b) | Wald | b (se b) | Wald |
| Step 1 | 14.24 (3)** | | | | |
| Gender (female) | | -.40 (.23) | 3.03† | -.37 (.34) | 1.17 |
| Overt Aggression | | -.41 (.20) | 4.49* | -.14 (.41) | .11 |
| Social Aggression | | .07 (.18) | .13 | -.20 (.42) | .23 |
| Step 2 | 5.67 (2) | | | | |
| Overt Aggression x Gender | | -.05 (.71) | .01 | -.38 (.86) | .20 |
| Social Aggression x Gender | | .81 (.44) | 3.31† | .87 (.61) | 2.04 |
| Step 3 | 1.19 (2) | | | | |
| Overt Agg (quadratic) | | -.01 (.08) | .01 | -.02 (.08) | .06 |
| Social Agg (quadratic) | | -.10 (.10) | 1.04 | -.17 (.21) | .68 |
| Step 4 | .99 (2) | | | | |
| Overt Agg (quadratic) x Gender | | | | .46 (.76) | .36 |
| Social Agg (quadratic) x Gender | | | | .05 (.24) | .04 |

* $p < .05$; ** $p < .01$

*Note*. For † , $p = .08$

Table 6:

Logistic Regression Results for Friendship Stability

| | Friendship Stability | | | | |
|---|---|---|---|---|---|
| | Step Statistics | | | Final Statistics | |
| Predictors | $\chi^2$ Δ (df) | b (se b) | Wald | b (se b) | Wald |
| Step 1 | 9.77 (3)* | | | | |
| Gender (female) | | .40 (.29) | 1.96 | .41 (.45) | .17 |
| Overt Aggression | | -.14 (.39) | .13 | -.52 (.79) | .43 |
| Social Aggression | | -.45 (.24) | 3.41† | -.43 (.64) | .46 |
| Step 2 | 2.45 (2) | | | | |
| Overt Aggression x Gender | | -1.39 (.93) | 2.25 | -.38 (1.13) | .12 |
| Social Aggression x Gender | | .56 (.62) | .83 | .05 (.78) | .00 |
| Step 3 | .91 (2) | | | | |
| Overt Agg (quadratic) | | .33 (.33) | 1.03 | 1.65 (1.06) | 2.43 |
| Social Agg (quadratic) | | -.02 (.12) | .03 | -.80 (.80) | .98 |
| Step 4 | 3.89 (2) | | | | |
| Overt Agg (quadratic) x Gender | | | | -1.76 (1.31) | 1.79 |
| Social Agg (quadratic) x Gender | | | | .84 (.81) | 1.06 |

* $p < .05$; ** $p < .01$,

*Note*. For † , $p = .07$

Table 7:

Prediction of Self-Reported Friendship Quality by Aggression and Gender

| | Time 2 Self-Reported Friendship Quality | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Positive | | | | | Negative | | | | |
| | Step Statistics | | | Final Statistics | | Step Statistics | | | Final Statistics | |
| Predictors | $\Delta R^2$ | b (se b) | β | b (se b) | β | $\Delta R^2$ | b (se b) | β | b (se b) | β |
| Step 1 | .39*** | | | | | .08*** | | | | |
| Time 1 FQ-Self | | .62 (.03) | .63*** | .52 (.03) | .54*** | | .30 (.04) | .28*** | .30 (.04) | .27*** |
| Step 2 | .05*** | | | | | .01 | | | | |
| Gender (female) | | .42 (.06) | .25*** | .44 (.08) | .25*** | | -.04 (.04) | -.04 | -.02 (.04) | -.02 |
| Overt Aggression | | .00 (.04) | .00 | -.02 (.05) | -.02 | | -.01 (.03) | -.01 | .16 (.08) | .27* |
| Social Aggression | | .06 (.04) | .06 | .08 (.07) | .08 | | .06 (.03) | .09 | .00 (.07) | .00 |
| Step 3 | .00 | | | | | .00 | | | | |
| Overt Agg. x Gender | | .14 (.14) | .05 | -.08 (.20) | -.03 | | -.06 (.11) | -.04 | -.05 (.14) | -.03 |
| Social Agg, x Gender | | -.05 (.09) | -.04 | -.11 (.14) | .07 | | .00 (.07) | .00 | -.02 (.10) | -.03 |
| Step 4 | .01* | | | | | .02* | | | | |
| Overt Agg (quad) | | .00 (.02) | .00 | -.01 (.02) | -.05 | | -.04 (.01) | -.30** | -.03 (.01) | -.26* |
| Social Agg (quad) | | -.05 (.02) | -.15* | -.03 (.03) | -.09 | | .01 (.01) | .08 | .01 (.02) | .06 |
| Step 5 | .00 | | | | | .01 | | | | |
| Ovt Agg (quad) x Gender | | | | .12 (.09) | .06 | | | | -.12 (.06) | -.11 |
| Soc Agg (quad) x Gender | | | | -.05 (.04) | -.11 | | | | .02 (.03) | .08 |

*Note*. *$p < .05$; **$p < .01$; ***$p < .001$; FQ=Friendship Quality

Table 8:

Prediction of Friend-Reported Friendship Quality by Aggression and Gender

| | Time 2 Friend-Reported Friendship Quality | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Positive | | | | | Negative | | | | |
| | Step Statistics | | | Final Statistics | | Step Statistics | | | Final Statistics | |
| Predictors | $\Delta R^2$ | b (se b) | β | b (se b) | β | $\Delta R^2$ | b (se b) | β | b (se b) | β |
| Step 1 | .38*** | | | | | .12** | | | | |
| Time 1 FQ-Friend | | .65 (.10) | .61*** | .48 (.12) | .46*** | | .43 (.14) | .35** | .46 (.16) | .37** |
| Step 2 | .06 | | | | | .07 | | | | |
| Gender (female) | | .45 (.18) | .26* | 1.27 (.41) | .73** | | -.09 (.11) | -.09 | -.53 (.28) | -.58 |
| Overt Aggression | | -.16 (.36) | -.05 | -.30 (.58) | -.10 | | -.35 (.23) | -.22 | -.05 (.39) | -.03 |
| Social Aggression | | .08 (.26) | .04 | -.12 (1.45) | -.11 | | .37 (.16) | .31* | 1.56 (.98) | 1.33 |
| Step 3 | .00 | | | | | .02 | | | | |
| Overt Agg. x Gender | | -.07 (.83) | -.02 | 1.34 (1.61) | .38 | | -.59 (.53) | -.31 | -1.04 (1.12) | -.55 |
| Social Agg, x Gender | | .36 (.68) | .15 | .11 (1.48) | .05 | | .03 (.43) | .02 | -1.07 (1.01) | -.87 |
| Step 4 | .10** | | | | | .03 | | | | |
| Overt Agg (quad) | | .62 (.45) | .18 | .27 (.68) | .08 | | -.46 (.31) | -.25 | -.89 (.46) | -.48 |
| Social Agg (quad) | | -1.38 (.37) | -.38*** | .06 (2.17) | .02 | | .05 (.26) | .03 | 1.92 (1.47) | 1.00 |
| Step 5 | .00 | | | | | .02 | | | | |
| Ovt Agg (quad) x Gender | | | | .78 (2.25) | .12 | | | | .45 (1.57) | .13 |
| Soc Agg (quad) x Gender | | | | -1.56 (2.22) | -.45 | | | | -1.93 (1.52) | -1.05 |

*Note*. *$p$ < .05; **$p$ < .01; ***$p$ < .001; FQ=Friendship Quality

Table 9:

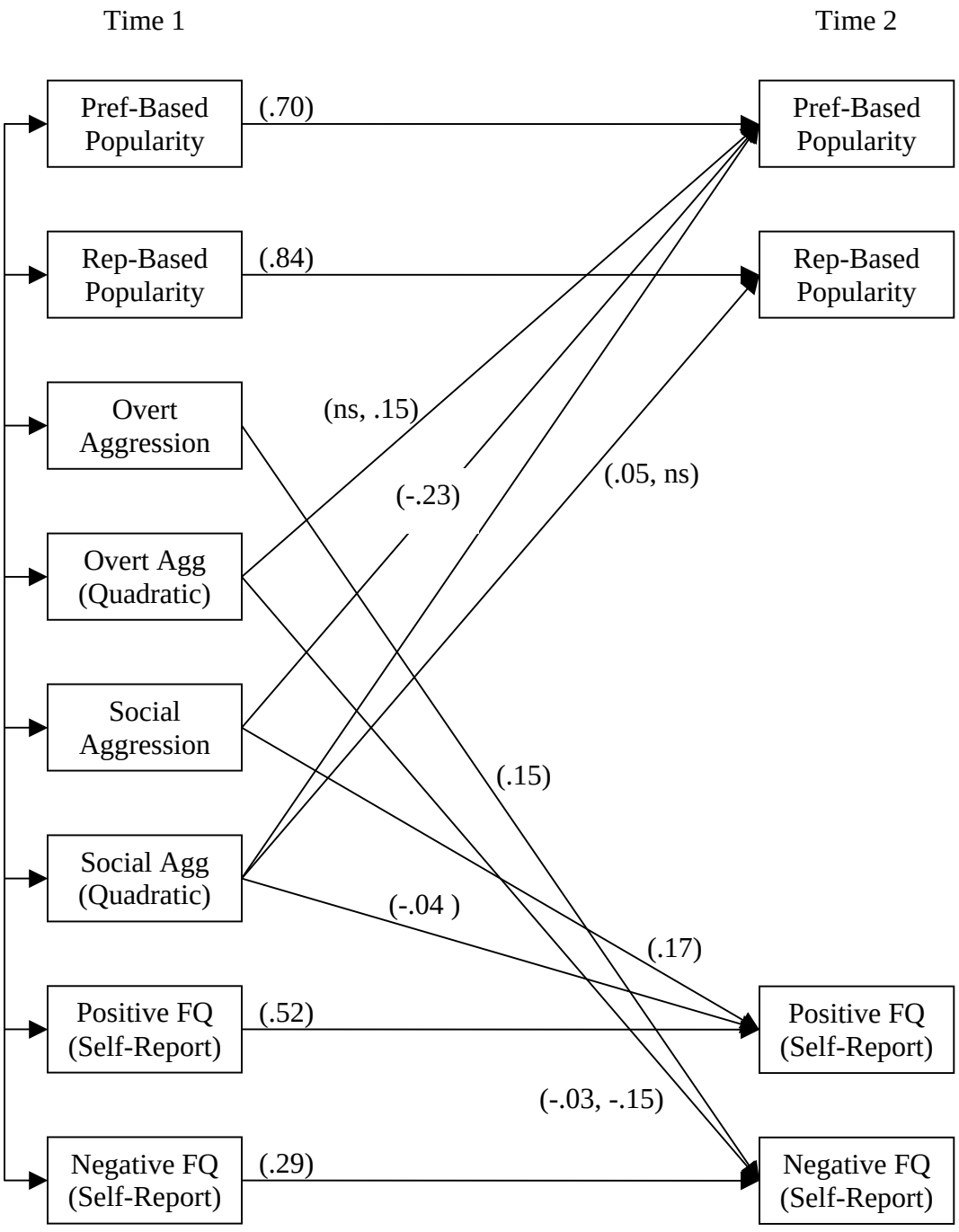
Fit Indexes for the Nested Sequence of Models Tested in the Path Analysis

| Model/Description | $\chi^2$ | *df* | $\Delta\chi^2$ | $\Delta$ *df* | *p* |
|---|---|---|---|---|---|
| 1. Theoretical model | 60.10 | 32 | | | |
| 2. Fully constrained model | 103.51 | 55 | 43.41 | 23 | <.001 |
| 2a. Constrain stability PP | 61.70 | 33 | 1.60 | 1 | .206 |
| 2b. Constrain stability RP | 63.84 | 33 | 3.74 | 1 | .053 |
| 2c. Constrain stability FQPos | 63.80 | 33 | 3.70 | 1 | .054 |
| 2d. Constrain stability FQNeg | 60.10 | 33 | 0.00 | 1 | 1.000 |
| 2e. New baseline model | 64.18 | 36 | 4.08 | 3 | .395 |
| 3a. Constrain SA→ PP | 74.68 | 37 | 10.50 | 1 | .001 |
| 3b. Constrain $OA^2$→ PP | 71.30 | 37 | 7.12 | 1 | .008 |
| 3c. Constrain $OA^2$→ RP | 68.80 | 37 | 4.62 | 1 | .032 |
| 3d. Constrain $OA^2$→ FQNeg | 68.20 | 37 | 4.02 | 1 | .045 |
| 3e. Constrain $SA^2$→ PP | 78.60 | 37 | 14.42 | 1 | <.001 |
| 3f. Constrain $SA^2$→ RP | 73.60 | 37 | 9.42 | 1 | .002 |
| 4. Final model | 71.10 | 46 | 6.92 | 10 | .730 |
| 5. Trim nonsignificant paths | 75.20 | 50 | 4.10 | 4 | .393 |

*Note.* PP=preference-based popularity, RP=reputation-based popularity, FQ=friendship quality, OA=overt aggression, SA= social aggression

Figure 1:

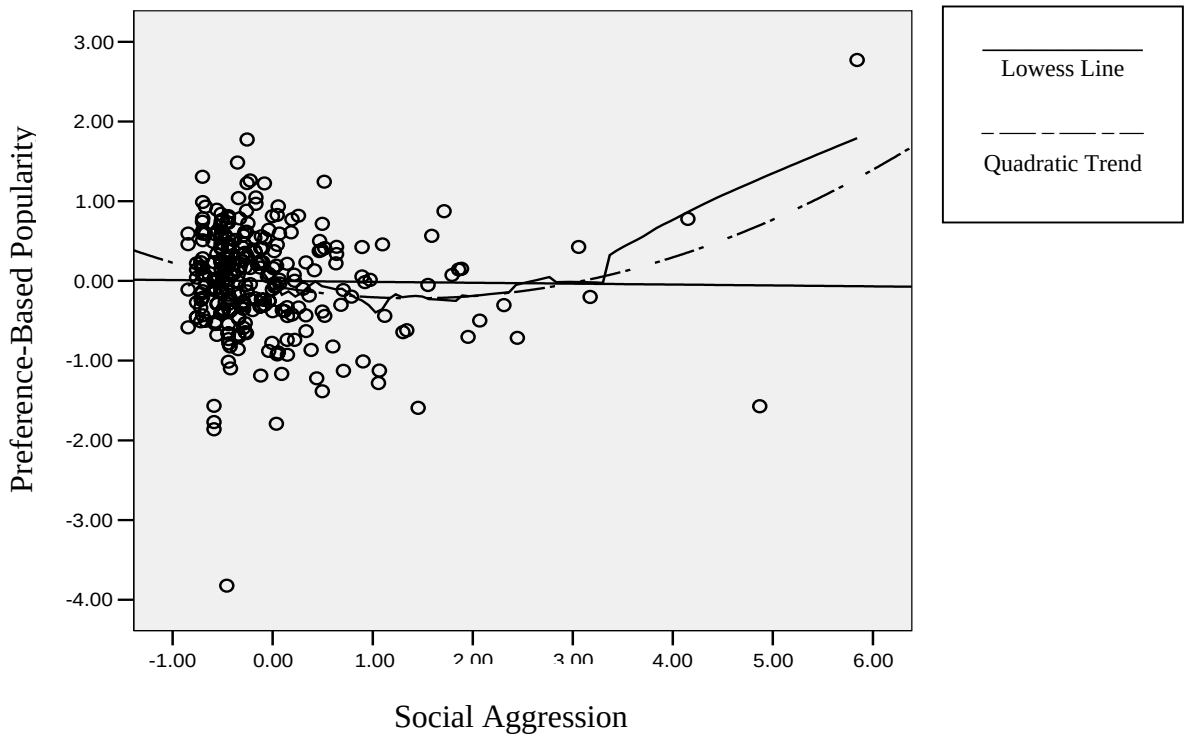
Path Analysis of Associations Among Primary Variables




*Note.* Standardized betas with at least one statistically significant ($p < .05$) path by gender are listed for (boys, girls). All other paths noted were fixed by gender.

Figure 2:

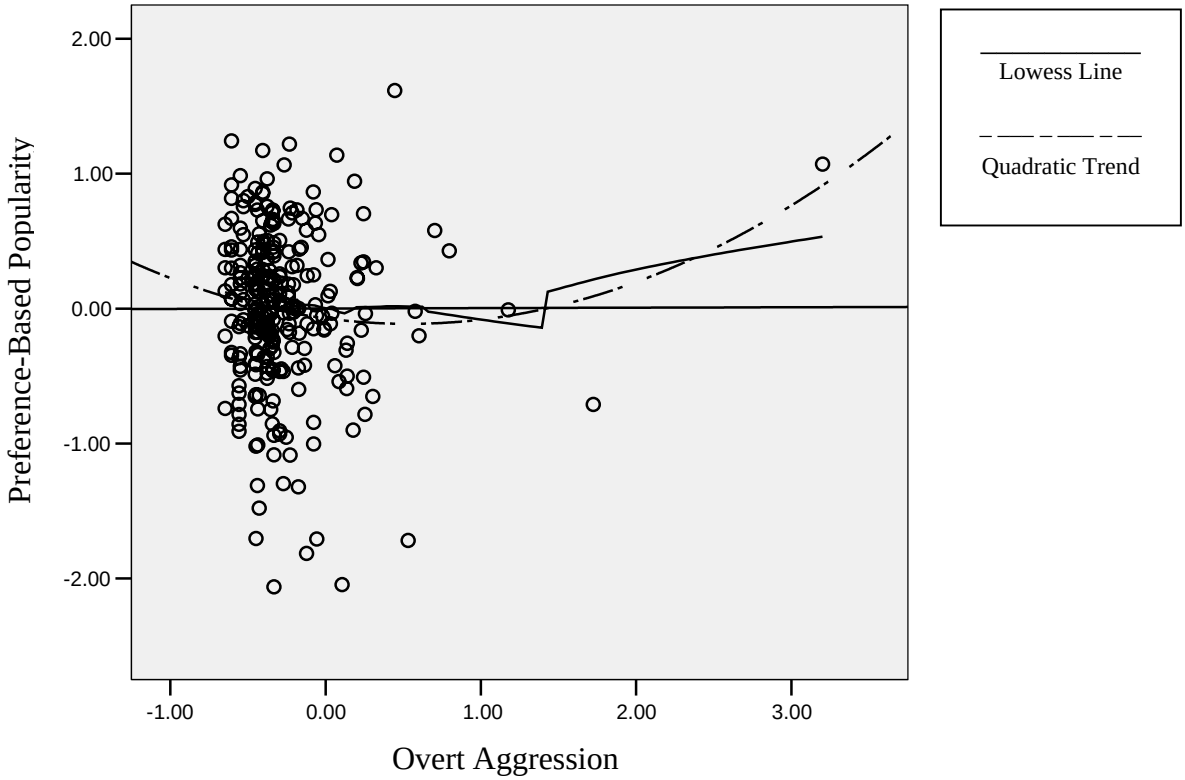
Curvilinear Trends of Social Aggression and Preference-based Popularity for Boys




*Note.* The values plotted on the y-axis represent the unstandardized residuals which were computed after controlling for all variables in the model except Time 1 social aggression, the quadratic term of Time 1 social aggression, the interaction term of gender and Time 1 social aggression, and the interaction term of gender and the quadratic term of Time 1 social aggression.

Figure 3:

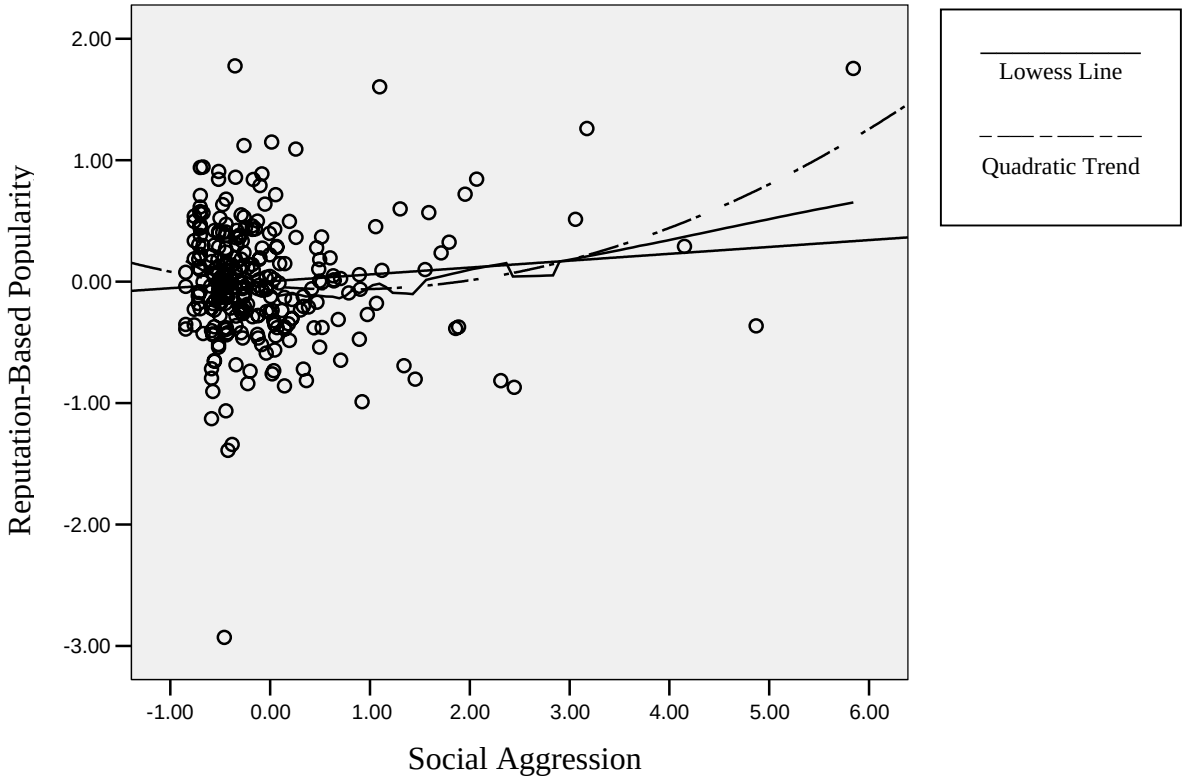
Curvilinear Trends of Overt Aggression and Preference-based Popularity for Girls




*Note*. The values plotted on the y-axis represent the unstandardized residuals which were computed after controlling for all variables in the model except Time 1 overt aggression, the quadratic term of Time 1 overt aggression, the interaction term of gender and Time 1 overt aggression, and the interaction term of gender and the quadratic term of Time 1 overt aggression.

Figure 4:

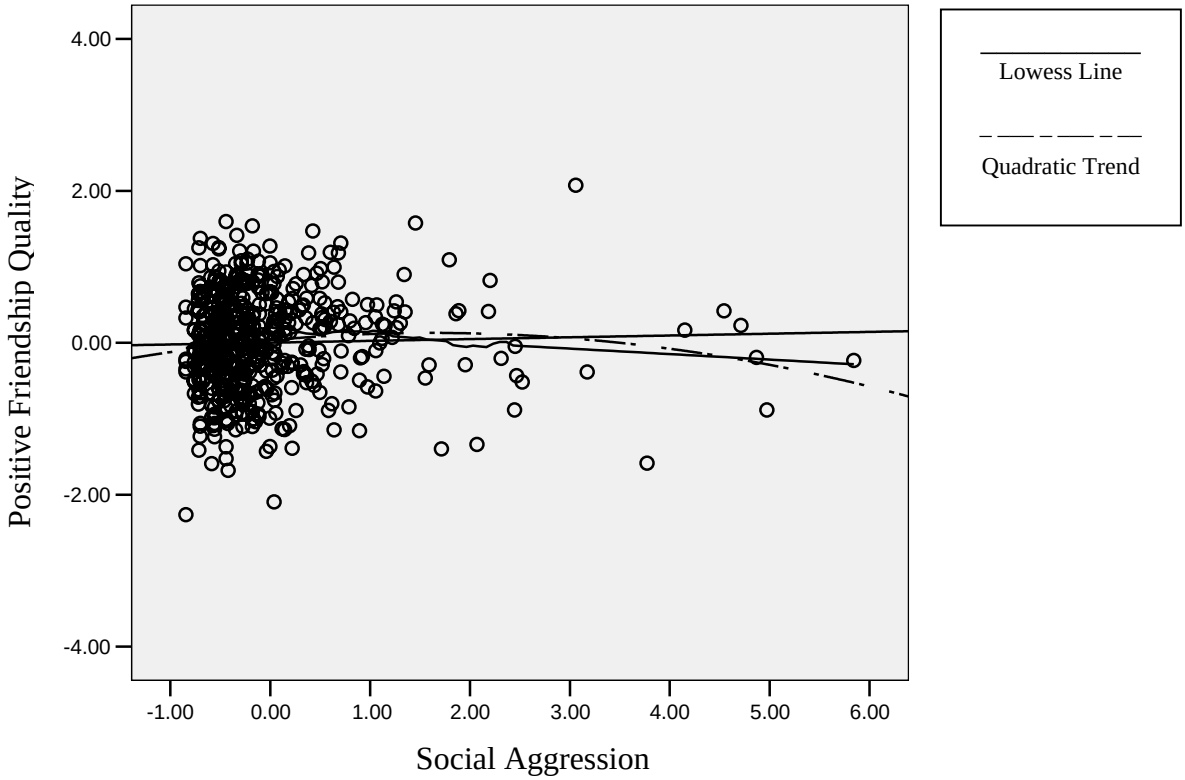
Curvilinear Trends of Social Aggression and Reputation-based Popularity for Boys




*Note*. The values plotted on the y-axis represent the unstandardized residuals which were computed after controlling for all variables in the model except Time 1 social aggression, the quadratic term of Time 1 social aggression, the interaction term of gender and Time 1 social aggression, and the interaction term of gender and the quadratic term of Time 1 social aggression.

Figure 5:

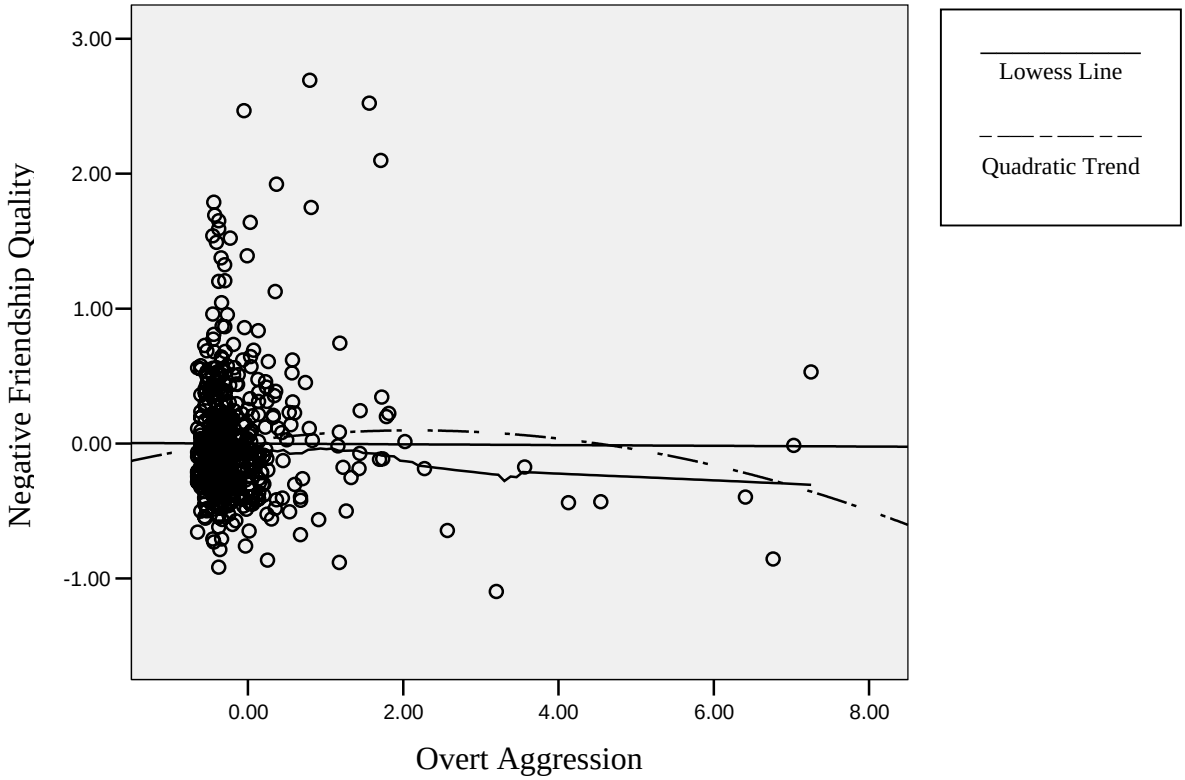
Curvilinear Trends of Social Aggression and Positive Friendship Quality




*Note*. The values plotted on the y-axis represent the unstandardized residuals which were computed after controlling for all variables in the model except Time 1 social aggression, the quadratic term of Time 1 social aggression, the interaction term of gender and Time 1 social aggression, and the interaction term of gender and the quadratic term of Time 1 social aggression.

Figure 6:

Curvilinear Trends of Overt Aggression and Negative Friendship Quality




*Note*. The values plotted on the y-axis represent the unstandardized residuals which were computed after controlling for all variables in the model except Time 1 overt aggression, the quadratic term of Time 1 overt aggression, the interaction term of gender and Time 1 overt aggression, and the interaction term of gender and the quadratic term of Time 1 overt aggression.

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